Three Accounting Research Essays in a Historical Setting

DISSERTATION

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To the reader:

Financial accounting research seems to be prone to fads. After decades of normative research anchored on more or less paradigmatic measurement theories, positivist empirical archival studies currently dominate the publication outlets. While this research enhances our understanding of financial accounting behavior, it has also become the object of criticism. One main issue is the lack of internal validity. This is why currently "identification" is the word of trade. Positivist studies are being judged, and rightly so, based on their ability to identify causal effects. This focus on internal validity has also increased the number of studies that use particular and sometimes strange settings to allow for so called "cute" identification. The obvious downside of this is the limited external validity of such studies.

At first glance, the dissertation papers of Jens Günther seem to follow this recent "cute identification trend". Using public and private firms of Imperial Germany to study determinants and consequences of accounting and disclosure sounds fancy but why should we care? The answer is simple: Because descriptive and out of sample evidence matters. The strength of the papers lies not with their identification strategy but with their descriptive appeal. Prior to the work of Jens Günther we knew relatively little about the accounting and disclosure behavior of Imperial firms. Now we know: They engage in strategic disclosure behavior that is associated with competition proxies in a way that is comparable with modern times. Also, the pre World War I Berlin stock market reacts to dividend surprises more or less like normal markets do. Finally, both public and private Imperial firms seem to set depreciation so that small losses are less likely than small gains. Besides the obvious contribution to the accounting history field, the results of Jens Günther also speak to the generalizability of findings based on current data. Just one example: Current equity markets are heavily regulated with respect to disclosure and trading while the Berlin stock exchange in Imperial Germany was comparably less regulated. Still the market reaction to news is remarkably similar on both markets, opening up the debate about the merits of current disclosure rules.

Taken together, the studies at hand substantially enhance our understanding of historical accounting behavior and help us to re-interpret current findings in the literature as well. Jens should be complemented for his decision to devote his time and energy to gather data and study firms of Imperial Germany. I hope that his studies will be widely read and used.

Berlin, July 10, 2015

Joachim Gassen

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Die vorliegende Arbeit ist das Ergebnis meiner fünfjährigen Tätigkeit als wissenschaftlicher Mitarbeiter am Institut für Rechnungswesen und Wirtschaftsprüfung der Humboldt-Universität zu Berlin. Sie wurde von der Wirtschaftswissenschaftlichen Fakultät im Sommersemester 2015 als Dissertation angenommen. Ohne die Hilfe vieler Personen im beruflichen und privaten Umfeld wäre dies niemals möglich gewesen. Ihnen sei nachfolgend gedankt.

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Jens Günther

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An Introductory Summary

The modern globalized environment has evolved towards a tremendous complexity. This applies in particular to (accounting) regulation. In the course of the last two decades firms were facing a large number of often concurrent regulatory changes both, from national and international sources. This often hampers accounting research in identifying the effects of a certain intervention (e.g. *Christensen et al. 2013*), which in turn hampers accounting research in developing statements on the determinants and consequences of certain accounting systems. However, even if one assumes that these changes are somehow isolable, the regulation itself can show a substantial level of complexity. David Tweedie, the former chairman of the IASB, is well known for the following statement on the regulation of accounting for financial instruments in IAS 39: "[…] if you understand it, you haven't read it properly – it's incomprehensible." (*Tweedie 2007*). My dissertation proposes a way to mitigate these issues by transferring modern accounting research questions to a historical setting, i.e. Imperial Germany. I assume that the complexity of both, the financial reporting regulation as well as the economic environment is noticeably lower in this setting than nowadays. This in turn should improve the analyses of the determinants and consequences of certain accounting systems. However, the external validity of the results with respect to modern settings might be limited since statistical inference based on a sample of firms that operated many decades ago is first of all geared towards the population of these firms. Nevertheless, this also applies to research in modern settings. From a strict methodological perspective, results derived from a sample of modern US or European firms do not add by any means to our understanding of accounting in general but only to the understanding of the specific situation of these firms. Hence, one has to believe that empirical accounting research is able to provide insights into accounting in general in both, modern and historical settings. However, even if one

strictly opposes to the idea that research in historical settings is able to generate results which are useful for our understanding of modern settings, it is still interesting from a purely descriptive perspective. Besides some very underdeveloped countries, there are hardly any modern settings showing such a low level of complexity in financial reporting regulation. Hence, the papers presented in this dissertation do at least add to our understanding of the determinants and consequences of financial reporting in a highly unregulated setting.

Of course, I am not the first to analyze modern research questions in a historical setting (e.g. *van Overfelt et al. 2010*; *Granja 2014*). And I am also not the first to analyze determinants and consequences of financial reporting in the historical German context. However, this dissertation adds to this literature, especially since earlier studies are mainly case study based (e.g. *Pleitgen 2005*), targeted towards a contribution in economic history (e.g. *Westermann 1966*), or using observation periods after World War I (e.g. *Spoerer 1998*).

In my first paper "Providing Disclosure in the Face of Competition - An Analysis of Financial Statements in Imperial Germany", I employ the beginning of the 1890s as a setting to analyze the association between product market competition and voluntary disclosure. Prior empirical archival evidence is mixed (*Beyer et al. 2010*). One potential explanation for this is an insufficient identification of voluntary disclosure. Prior literature predominantly focuses on subsets of voluntary disclosure such as segment reporting (*Botosan and Stanford 2005*), material contract filings (*Verrecchia and Weber 2006)*, or management forecasts (*Li 2010)*. However, *Lang and Sul (2014)* argue that different voluntary disclosure instruments can be differently affected by the same competitive environment. Some studies try to encounter this by using larger subsets of voluntary disclosure such as discretionary reporting within the annual report (e.g. *Depoers and Jeanjean 2012*). However, this once again only captures a part of the overall voluntary disclosure since important reporting instruments like sustainability reports or communication via the internet re-

main unconsidered. This is where my study contributes. The only regularly published information sources in the 1890s were the annual balance sheet and the annual income statement. In addition, managers were almost completely free in disaggregating the financial information within these financial statements. *Par. 29 ADHGB* merely obliged firms to report on six positions in their balance sheet and to give information on earnings. Hence, I follow prior literature on voluntary disclosure in unregulated settings (e.g. *van Overfelt et al. 2010*) and count the number of items reported in the financial statements of 285 publicly listed firms for the fiscal years 1890 and 1894.[1] Of course, this proxy does not perfectly capture the overall voluntary disclosure since firms communicated with their stakeholders besides the annual report, e.g. during the annual shareholder meeting. Nevertheless, I am able to capture a larger extent of the overall voluntary disclosure than prior research since the information contained in the annual reports of my sample firms represents a larger proportion of the information set than the annual reports of firms in modern settings. In order to capture the competitive environment, I apply the principal component approach of *Li (2010)* to construct proxies for potential competition, existing competition, and industry profitability. I find a statistically significant negative association between voluntary disclosure and potential competition. This also applies to the association between voluntary disclosure and industry profitability. However, the associations are only economically significant for industry leaders. The industries in the 1890s in Imperial Germany were characterized by substantial growth which promised high future rents *(Hahn 2011*) but also by substantial technological progress which induced a high uncertainty (*Haustein and Neuwirth 1982*). My results are consistent with industry insiders refraining from voluntary disclosure in this case in order to reduce the options of industry outsiders to obtain knowledge fostering a market entry (*Hayes and Lundholm 1996*). Moreover, I find a statistically and economically significant positive association

[1] I find a substantial variation in the level of disaggregation of financial information. The most opaque firm reports 16 items, the most transparent firm reports 125 items.

between existing competition and voluntary disclosure for industry followers. This is consistent with existing competition deteriorating the capital market profile of firms which in turn increases the benefits of voluntary disclosure in growth industries (*Huang and Li 2014*).

My results highlight the importance to capture both, the firms' voluntary disclosure as well as the competitive environment, as comprehensively as possible. While I find factor loadings and such a market structure comparable with *Li (2010)*, I do not confirm her associations. However, I am not able to assess whether this is due to her less precise voluntary disclosure proxy since an alternative explanation might arise from the specific economic conditions firms were facing at the peak of the industrialization in Imperial Germany. Hence, future research needs to employ more comprehensive voluntary disclosure proxies in order to analyze whether the mixed prior evidence is due to the focus on different voluntary disclosure instruments or arises from differences in the competitive environment. With respect to the latter point, future research also needs to improve the measurement of competition since the approach applied in my study e.g. ignores differences between price and quality competition (*Karuna 2010*).

However, one might ask what regulators can learn from the paper since firms that operated 125 years ago are not in their scope. Currently, the IASB is developing a discussion paper on 'Principles of Disclosure' as a consequence of the Agenda Consultation 2011. The IASB states: "Many respondents think that a disclosure framework is needed to ensure that information disclosed is more relevant to investors and to reduce the burden on preparers." (*IASB 2012: 21*). My study supports the IASB in evaluating the 'burden on prepares' since it shows that the competitive environment is not unambiguously associated with voluntary disclosure - even if voluntary disclosure can be measured very precisely. Instead, the association is determined by the relative importance of different competition dimensions as well as a firm's position within an industry (*Karuna 2007*; *Li 2010*). Hence, one might conclude that it is a futile attempt to set up a globally

applicable disclosure framework. I do not agree on this since regulators should also be interested in second best solutions. In any case, the IASB should be aware of the ambiguous associations between competition and voluntary disclosure.

Nevertheless, the transferability of results based on my setting to questions asked by modern regulators might generally be limited since managers in Imperial Germany might have faced different incentive structures. One prevailing argument in prior qualitative historical research supporting this apprehension is that capital markets in Imperial Germany were very inefficient due to the overwhelming dominance of universal banks (*Fohlin 2007a*). However, recent quantitative evidence does not support this notion (e.g. *Weigt 2005*; *Baltzer 2007*; *Fohlin 2007a*; *Burhop 2011*). My second paper "Capital Market Effects around Dividend Announcements - An Analysis of the Berlin Stock Exchange in 1895" adds to this literature.

In this paper, I conduct an event study focusing on the dividend announcements of 166 firms listed on the Berlin Stock Exchange (BSE) in 1895. I find statistically and economically significant positive (negative) cumulative abnormal returns following positive (negative) dividend surprises. Based on cross-sectional regression analyses, I furthermore show that these effects are less pronounced for smaller firms and firms providing less transparent financial reporting.[2] This is consistent with the dividend signaling hypothesis.[3] However, I do not find evidence consistent with the free cash flow hypothesis.[4] Moreover, I find that trading is increased around the dividend announcements of my sample firms. This is consistent with a differential belief revision among individual investors (*Kim and Verrecchia 1991, 1997)*. Finally, I provide evidence for a strong

[2] I use the voluntary disclosure proxy developed in my first paper as a proxy for financial reporting transparency. This is supported by a significant positive correlation between my voluntary disclosure proxy and the extent of the media coverage of the annual report.

[3] The dividend signaling hypothesis predicts that managers can use dividends to signal future firm performance.

[4] The free cash flow hypothesis predicts that managers can use dividends to mitigate agency conflicts since cash outflows via dividends reduce their potential to engage in empire building and overinvestment.

increase in supply surpluses before the announcement of negative dividend surprises. This is consistent with insiders trading on private information.

Since these effects have been extensively shown on modern capital markets (e.g. *Amihud and Li 2006*; *Bamber et al. 2011*) the paper primarily contributes to the historical literature. My results support the notion that the historical BSE showed a degree of efficiency comparable to modern capital markets, irrespective of the presence of powerful banks (e.g. *Fohlin 2007a*). However, besides this contribution my results also support the general research approach of my dissertation. The findings should enhance the acceptance of the feasibility to transfer results based on my setting to modern questions. I show that signaling devices like dividend surprises were of less importance for firms showing a richer information environment. Thus, investors at the BSE systematically reacted to information provided by managers conditional on the quality of the information environment just as modern capital market participants do. This in turn should have imposed comparable incentives for managers to communicate with capital market participants. Prior literature however is silent on share-based payment. Nevertheless, performance-related bonus compensation was present (e.g. *Burhop 2006*). Thus, the differences between the incentive structures of historical and modern managers seem to be rather small which supports the feasibility to conduct modern accounting research in my setting. However, the study also has implications for research in modern settings. Financial systems are usually divided into bank-based and market-based systems. While this dichotomy helps to compare financial systems in an intuitive way, it can give rise to a misleading conclusion, i.e. that the poles are mutually exclusive (*Fohlin 2007b*). My results in contrast support the notion that a financial system can feature both, influential banks and efficient capital markets (e.g. *Fohlin 2007a*). Finally, my results are also consistent with capital markets being efficient in the absence of modern capital market regulation. This is

surprising since a major justification of modern regulators is the protection of capital market efficiency. However, my research design is not aligned towards a test of the effect of regulation.

After investigating disclosure and capital market effects, my third paper "Bank-Dominated Supervisory Boards and Earnings Management - An Analysis of German Firms before World War I" completes my dissertation by analyzing the interplay of corporate governance and earnings management. For this purpose, I analyze supervisory boards and financial statements of 50 public and 50 private German firms for the fiscal years 1903-1907. I confirm prior evidence by showing a substantial presence of bank directors on the supervisory boards (e.g. *Burhop 2006*). Moreover, I find earnings kinks as reported by *Burgstahler and Dichev (1997)* and that these kinks disappear once I adjust earnings for depreciations. Further analyses reveal a reasonable dispersion of (absolute) discretionary depreciations. These findings are indicative of earnings management. However, I do not find statistically significant associations between the earnings kinks and bank directors taking the position of the chairman or the deputy chairman.[5] Based on a propensity score matching, I do also not find a statistically significant association between bank-dominated supervisory boards and the level of (absolute) discretionary depreciations. Hence, I do not find evidence consistent with bank-dominated supervisory boards being associated with the level of earnings management.

These findings firstly add to research on the influence of banks on German firms before World War I. While it is widely accepted that banks established close ties with many firms (e.g. *Fohlin 2007a*), it remains an unresolved question whether banks actually evolved an influence on these firms (e.g. *Guinnane 2002*). This paper supports the perspective that the influence, if present at all, was not as strong as often suggested (e.g. *Fohlin 1998*). Financial reporting is a major firm-

[5] *Fohlin (2007a)* states that these positions are more influential than normal board positions. Thus, I treat a supervisory board as 'bank dominated' if a bank director takes the position of the chairman or the deputy chairman.

level information device and if banks would have had a significant influence on the firms, they most likely would have influenced financial reporting outcomes in either direction. Nevertheless, the results do not necessarily imply that supervisory boards were ineffective (*Horn 1979*). Instead, the results are merely consistent with bank affiliated supervisory board members being not more or less effective in monitoring than other board members.

Secondly, the results add to research on board compositions and earnings management. Prior empirical evidence in this literature stream is mixed (*Armstrong et al. 2010*). In this context, *Brown et al. (2011)* highlight the importance to analyze the institutional context in which boards are operating. The beginning of the 20th century in Germany offers an institutional context showing characteristics which are less distinct in modern settings. First, the financial reporting regulation was extremely principle-based (*Hoffmann and Detzen 2013*). Thus, supervisory boards were an important mechanism to reduce opportunistic influences on financial statements (*Kothari et al. 2010*). In addition, supervisory boards were in general more important than nowadays since external audits were not mandatory and voluntary audits were perceived to be of low quality (*Evans 2003*). However, while my setting offers two prominent features, i.e. a high level of regulatorily induced earnings management opportunities due to the high level of principle based financial reporting regulation and a high importance of monitoring by supervisory boards due to missing external auditing, I am not able to show that financial experts sitting on supervisory boards reduce the level of earnings management.

This finding adds to discussions on desirable board compositions. Recent corporate governance regulations like Sec. 407 of the Sarbanes-Oxley Act or *Par. 100.5 AktG* emphasize the importance of the presence of independent financial experts on corporate boards. This is generally reasonable since board members exhibiting a professional background in the financial industries are supposed to have a more distinct skill set to identify opportunistic earnings management.

However, prior literature also shows that it is the board's quality that is determining how well the monitoring function is performed and not a possibly exogenously imposed board structure (e.g. *Sarkar et al. 2008*). Thus, a board's monitoring quality is not ipso facto increased by the mere presence of financial experts and regulators should be aware of this.

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Providing Disclosure in the Face of Competition
An Analysis of Financial Statements in Imperial Germany

Abstract

This paper revisits the relationship between product market competition and voluntary disclosure. Prior evidence is mixed. One potential explanation for this is an insufficient identification of the firms' overall voluntary disclosure strategy. Hence, I transfer the research question to Imperial Germany in the 1890s because the comparably less complex reporting environment allows for a cleaner identification of voluntary disclosure. Since the presentation of financial statements is essentially unregulated at that time, I use the level of disaggregation of financial information in these financial statements as a proxy for voluntary disclosure. I capture existing and potential competition as well as industry profitability by applying the principal component analysis of *Li (2010)*. Based on a balanced panel of 570 firm-years, I find a negative association between voluntary disclosure and potential competition. This association is more pronounced for industry leaders. Furthermore, I find a negative association between industry profitability and voluntary disclosure. This association is also more pronounced for industry leaders. Finally, I find a positive association between existing competition and voluntary disclosure for industry followers. The associations are statistically significant and economically meaningful. The results are robust against the inclusion of firm-level control variables capturing agency conflicts, firm size, firm performance, and capital structure.

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1 Introduction

Theory predicts that firms are reluctant to provide voluntary disclosure if they face proprietary costs (*Verrecchia 1983)*. This is constantly validated by surveys (*Graham et al. 2005; Dedman and Lennox 2009)*. However, prior empirical archival studies are inconclusive about the influence of proprietary costs on the level of voluntary disclosure (*Beyer et al. 2010*). One shortcoming of this stream of literature is a predominant focus on a specific component of disclosure such as segment reporting (e.g. *Botosan and Stanford 2005*). This comes at the advantage of an intuitive connection between competition and disclosure in general. However, *Lang and Sul (2014)* argue that a certain source of competition, e.g. industry concentration, is related to various sources of proprietary costs, i.e. information about production costs or information about future demand. Thus, different voluntary disclosure instruments can be differently affected by the same competitive environment. Prior literature does not sufficiently take this into account.

I address this shortcoming by investigating the financial statements of 285 publicly listed firms in Imperial Germany for the fiscal years 1890 and 1894. The comparably less complex reporting environment of these firms allows for a cleaner identification of voluntary disclosure. The German commercial code (*ADHGB*) required firms to publish a balance sheet and an income statement on an annual basis. In addition, the *ADHGB* essentially did not stipulate a minimum presentation scheme for these financial statements. Thus, I follow prior literature on voluntary disclosure in unregulated settings (e.g. *van Overfelt et al. 2010*) and use the level of disaggregation of financial information in the balance sheet and the income statement as a proxy for voluntary disclosure. Since descriptive evidence suggests that firms did not extensively engage in additional voluntary reporting as we observe it nowadays, this approach enables me to capture a larger fraction of the voluntary disclosure strategy than prior research.

Moreover, the setting comes at the advantage of a competitive environment that shows extreme characteristics which in turn allow for clearer hypotheses about the relation between competition and voluntary disclosure. The firms in my sample are operating during the peak of the industrialization in Imperial Germany. This period is marked by considerable industry-level growth (*Hahn 2011*), substantial investments (*Rettig 1978*), and constant technological progress (*Haustein and Neuwirth 1982*). To capture fundamental dimensions of competition in this environment, I differentiate between potential competition, existing competition and industry profitability (*Karuna 2007*). I follow *Li (2010)* and develop proxies for these dimensions conducting a principal component analysis based on six different competition proxies.[6]

I hypothesize that firms in my setting refrain from extensive disclosure if they face potential competition. The market conditions promise high future rents which firms want to protect against industry outsiders. These outsiders in turn are facing markets which are characterized by continuous technological progress. On the one hand, this might reduce existing entry barriers since prior investments of incumbents are sunk costs. On the other hand, this also might generate additional entry barriers since the dynamic environment demands a high level of experience and expertise. Considering this, I expect firms to be more opaque to avoid attraction from industry outsiders and to reduce opportunities for these outsiders to learn relevant details about the industries. This is in line with theoretical arguments predicting that firms refrain from extensive disclosure in cases where potential market entrants are not aware of the potential markets (*Hayes and Lundholm 1996)*. Consistent with my hypothesis, the results show a statistically and economically significant negative association between potential competition and voluntary disclosure. This association is more pronounced for industry leaders.

[6] These proxies are the weighted average of PPE, the market size, the four firm concentration ratio, the Herfindahl-Hirschman Index, the industry-level price-cost margin, and the industry-level mean of the ROA.

With respect to the association between existing competition and voluntary disclosure I follow the reasoning of *Huang and Li (2014)* who show that firms in growing industries provide higher levels of voluntary disclosure than firms in non-growth industries. They argue that existing competition deteriorates the capital market profile of firms which in turn increases the potential benefits of voluntary disclosure. Since firms in growing industries invest more and are therefore more reliant on additional (external) financing, their findings are consistent with this explanation. In my setting even more mature industries are considerably growing and firms are continuously investing. In addition, descriptive analyses show that firms are largely financed by (public) equity. Hence, I hypothesize a positive association between voluntary disclosure and existing competition. I find this association. However, the association is only statistically and economically significant for industry followers.

The hypothesis on the association between industry profitability and voluntary disclosure is derived from the preceding hypotheses. Higher levels of industry profitability can be explained by both, higher potential competition (*Newman and Sansing 1993*) and lower existing competition (*Shaked and Sutton 1982)*. Since I expect potential (existing) competition to be negatively (positively) related to voluntary disclosure, I hypothesize that industry profitability is negatively related to voluntary disclosure. I find this association and the association is again more pronounced for industry leaders. However, the economic significance is negligible.

The results are robust against the inclusion of firm-level control variables capturing different alternative explanations. Prior literature shows that the consideration of agency conflicts is indispensable in studies analyzing the relationship between competition and voluntary disclosure (*Berger and Hann 2007*). Thus, I employ a binary dummy variable that equals one, if the firm raises public equity or debt between January 1, 1890, and December 31, 1895, to capture the se-

verity of ex-ante agency conflicts. To capture the severity of ex-post agency conflicts, I include the asset utilization ratio into my analyses in order to measure how efficiently a firm is managed. In addition, I consider the level of variable compensation, since prior literature suggests variable compensation as a mechanism to align the interests of principals and managers (*Jensen and Meckling 1976*). Moreover, I control for firm size by the logarithm of total assets, for firm performance by the return on assets, and for the capital structure by the equity quota.

This paper adds to the literature on the relationship between competition and voluntary disclosure by transferring the research question to a historical setting. The setting allows me to capture a significant fraction of the overall voluntary disclosure. Prior research mainly identifies voluntary disclosure in special cases like segment reporting or management forecasts. However, *Lang and Sul (2014)* argue that the same competitive environment can differently affect different disclosure instruments. My study comes, in contrast to this, at the advantage that I am able to analyze how competition relates to voluntary disclosure in general. In addition, the competitive environment in Imperial Germany shows extreme characteristics that allow for clearer hypotheses. Modern settings in contrast show comparably moderate characteristics and hence potentially ambiguous relationships. My findings support e.g. research on segment reporting (e.g. *Botosan and Stanford 2005*) that hypothesize a negative association between potential competition and voluntary disclosure in cases where industry insiders expect potentially high future rents, while industry outsiders are uncertain about the market conditions. My results furthermore support the findings of *Huang and Li (2014)* by confirming evidence of a positive association between existing competition and voluntary disclosure in growth-industries. Moreover, this paper adds to the literature on voluntary disclosure in unregulated settings in general (e.g. *van Overfelt et al. 2010*) and the financial reporting of firms in Imperial Germany in particular (e.g. *Günther 2015a*).

The remainder of this paper is organized as follows. Section 2 outlines the environment German firms were facing in the 1890s. Section 3 develops hypotheses and presents the empirical analyses. Section 4 concludes.

2 Imperial Germany in the 1890s

Political and Institutional Environment

Imperial Germany was founded in 1871 following the 'Wars of German Unification' against France. It was a compound of 25 federal states organized in a constitutional monarchy. The Prussian Kingdom was the most influential part of the Empire. The head of state, the German emperor, was king of Prussia at once. The head of government, the German chancellor, was directly appointed by the German emperor and became prime minister of Prussia at once. The German emperor and the German chancellor were equipped with an extensive set of competencies with respect to the foreign affairs. In addition, the German emperor was the sole commander in chief of the German military. However, the domestic politics were characterized by democratic components. An elected parliament and the federal council of Imperial Germany were entitled to pass legislation and decide upon the government budget.

The 1890s were marked by the 'Wilhelmian Era' after the dismissal of the influential chancellor Otto von Bismarck. The foreign policy was characterized by imperialistic tendencies. The domestic politics were characterized by an incipient social legislation at the beginning of the 1890s and the passage of a unified civil law code and a revised commercial code at the end of the decade. Within my observation period (1890-1894) only one major regulatory shock took place that might affect my results. In 1891 a tax reform was passed introducing corporate income taxes based on financial statements. Since taxes are not linked to the level of disaggregation of financial information, I do not expect this reform to have an influence on my results.

Economic Conditions, Cartels and Universal Banks

The firms in the sample were operating during the peak of the industrialization which was marked by the beginning of the prosperity period of the third Kontradieff wave (*Kontradieff 1926*). While emerging industries like the chemical industry showed extreme growth rates even more mature industries were substantially growing (*Hahn 2011*). This growth was accompanied by large investments (*Rettig 1978*) and stimulated by constant technological progress (*Haustein and Neuwirth 1982*). Supported by these effects the German Empire reached an important position among the world's biggest economies at the end of the 19th century.

One feature of this economy was the legal existence of cartels. This could have implications for my research design since cartels are perceived to dilute competition. However, *Pohl (1978)* shows that cartels mainly occurred in coal mining, the steel industry, and the chemical industry. He also shows that cartels in the chemical industry were very instable and thus, only a few industries in my study could be significantly affected by cartel agreements. However, even firms in the powerful Rhenish-Westphalian Coal Syndicate still faced substantial competition from cartel-outsiders and importers (*Lübbers 2009*). Additionally, firms in this cartel were materially engaged into non-controlled segments (*Peters 1989*) and thus, experienced competition from this source. Therefore, I recognize the existence of cartels but assume that they did not significantly bias the competition firms were facing.[7] This is supported by *Burhop and Lübbers (2009)* who show that the productive efficiency was not affected by the cartelization.

This is surprising since early qualitative research on universal banks claims that cartels were an instrument of these banks to restrict competition between their clients (*Borchardt 1973*). This argument is in line with an overestimation of the universal banks' influence in these studies that

[7] Untabulated analyses show that the exclusion of ‚mining and steel producer' does not change the findings.

is not supported by recent quantitative evidence (*Fohlin 2007*). Banks were prominently involved in the foundation and IPOs of stock corporations (*Burhop 2006*). Banks held equity stakes or took (interlocking) mandates in supervisory boards (*Fohlin 2007*). However, *Fohlin (2007: 327)* concludes: "Banks do not - and never did - control most of the corporate economy. Broadly speaking the idea of the banks' domination of corporate ownership or control is just as much a myth for present-day Germany as it is for the industrialization period." This is also supported by *Günther (2015a)* who does not find a significant association between the presence of bank directors on supervisory boards and the level of earnings management.

Capital Markets

The firms in my sample are listed on the Berlin Stock Exchange (BSE). The BSE was the most influential out of 14 stock exchanges in Imperial Germany (*Gömmel 1992; Fohlin 2007*). Even after a severe stock market scandal in 1873 many IPOs were conducted and the number of listed firms constantly grew to over 600 firms in the 1890s (*Weigt 2005*). Performance indices show that share prices were mainly increasing (e.g. *Ronge 2002*). The year 1891 however is characterized by price declines and a call for stricter investor protection which finally led to a stock exchange law in 1896 (*Fohlin 2007*).[8] With respect to the primary capital market, *Burhop (2011)* shows that underpricing of IPOs was present. Similarly, the secondary capital market shows patterns known from modern capital markets. *Gelman and Burhop (2008)* find a low level of autocorrelation of daily index returns. *Weigt (2005)* shows that arbitrage opportunities did not exist for cross-listed firms. *Weigt (2005)* also shows that portfolio returns were higher (lower) conditional on a positive (negative) market risk premium for increasing portfolio betas. Additionally, prior literature shows that the market reacted to news like the announcement of regulatory inter-

[8] I analyze financial statements of 1890 and 1894. The stock market crisis in 1891 might have caused systematic differences in these statements. However, the consideration of year dummies does not change my results.

ventions (*Wetzel 1996),* cartel agreements (*Bittner 2005*), macroeconomic shocks (*Baltzer 2007*), and dividend surprises (*Günther 2015b*).

Financial Reporting

Following a severe stock market scandal in 1873, a law on stock corporations was passed in 1884. The law imposed strict rules for the foundation of stock corporations, manifested a two-tier corporate governance system and changed the rules for financial reporting. From 1884 onwards firms had to provide a balance sheet, an income statement, corresponding notes and a management report to the shareholders no later than two weeks before the annual shareholder meeting (*Par. 239 ADHGB*). The annual shareholder meeting had to take place no later than three months after the fiscal year end (*Par. 239 ADGHB*).[9] After approval by the annual shareholder meeting firms had to publish the balance sheet and the income statement in a newspaper and deposit these financial statements at the company register within six months (*Par. 239b, 185c ADHGB*). A minimum presentation scheme was essentially not regulated. According to *Par. 29 ADHGB* firms only had to list six items in their balance sheets: property, receivables, cash, other assets, equity, and liabilities. Firms were obliged to value current assets according to the lower of cost or market principle (*Par. 239b, 185a ADHGB*). However, firms were allowed to value non-current assets with amortized costs, irrespective of a potentially lower market value.[10] Audits had to be conducted by the supervisory board (*Par. 225 ADHGB)*. Figure 1 depicts the timeline of the events.

[Figure 1 about here]

From a modern perspective, the procedure for the publication of financial information seems odd since it prefers the information demand of current shareholders (*Henke 2009*). These shareholders had a superior information access stemming from additional financial statements, i.e. the notes

[9] However, firms were allowed to postpone the deadline for the annual shareholder meeting up to six months after the fiscal year end in their articles of incorporation (*Par. 239 ADHGB*).
[10] See *Hoffmann and Detzen (2013)* for an overview on asset valuation in Imperial Germany.

and the management report. Besides this, they also could access the information earlier. However, descriptive evidence suggests that an unregulated mechanism evolved to reduce the regulatory induced information disadvantage of outsiders. I read the volume 1895 of the *'Berliner Börsen-Zeitung'* (*BBZ*), which was an important capital market related newspaper used by many firms for official publications. In this newspaper I find articles covering the full annual reports. Table 1 presents descriptive statistics of these articles and the timeline.

[Table 1 about here]

The results show that most firms conducted the annual shareholder meeting within the first four months after the fiscal year end. I can not clarify whether the firms legitimately chose to prolong the deadline for the shareholder meeting up to six months after the fiscal year end since I do not have access to the articles of incorporation. However, the distribution of *FYE_Meeting* does not suggest that non-compliance is a material issue. The shareholder meeting was on average announced 27 days in advance. The *BBZ* covered the annual reports on average 13 days after this announcement and on average 13 days before the shareholder meeting took place. Since firms had to hand out the annual report to the shareholders no later than two weeks before the shareholder meeting, I assume that the media coverage substantially reduced the disadvantages in information access of firm outsiders. The *BBZ* covered most of the annual reports (249 out of 285). The corresponding section of the *BBZ* was organised in three columns. The coverage of the annual reports comprised on average 89 lines (median: 76 lines) within one of these columns. Hence, I assume that the information content of the annual reports was largely represented.

Appendix A gives two examples. The first example (*Höchster Farbwerke*) shows a comparably opaque financial reporting. The annual report mainly comprises vague and more abstract statements on firm- and industry-specific trends. The published balance sheet and income statement are comparably aggregated and mainly list less expressive items. In contrast, the second example

(*Schultheiss Brauerei*) shows a comparably transparent financial reporting. The annual report extensively discusses firm- and industry-specific details. The published balance sheet and income statement are comparably disaggregated and give a detailed overview. Beyond that, I randomly select 60 firms and perform a content analysis of the media coverage. The reports were evaluated by a research assistant and me. Disagreements on the assessment of the information were discussed. Table 2 shows the results of this analysis.

[Table 2 about here]

The results show that most firms reported on both, industry- and firm-specific trends. However, the industry-specific trend was more often outlined as negative, while the firm-specific trend was more often positively evaluated. This is not in line with the general positive industry-level development at that time, especially since the year 1895 marks the beginning of a boom (*Hahn 2011*). This might suggest that firms tried to understate the industry-specific trend in order to reinterpret the positive trend as firm-specific. It also might suggest that firms tried to understate the trend in order to secure their potential to exploit future rents. However, these results are merely descriptive in nature and one has to be careful with such interpretations. We also compare the media coverage of the annual reports with the finally published financial statements in order to rule out that the finally published financial statements were differently disaggregated. Panel B of table 2 shows that there is no indication for this. However, in several cases the income distribution was discussed in the annual report while it was not displayed in the published balance sheet or income statement for some reason. Since my voluntary disclosure proxy adjusts for the effect of the income distribution, I do not expect this to have an impact on my results.

Table 1 also shows that firms were very fast in officially publishing the balance sheet and the income statement. Even the maximum time span of 10 days between the shareholder meeting and the publication is still far below the deadline of six months. However, I am not able to find a sin-

gle full annual report voluntarily published by a firm. This might be explained by the extensive media coverage. However, firms did not intensively engage in voluntary reporting anyway. Some firms regularly published periodic figures on revenues. Some firms irregularly commented on firm- and industry-specific trends. A few firms even prepared quarterly reports which were covered by the *BBZ* but not officially published by the firm. However, there are no indications for a general additional voluntary reporting as we observe it nowadays.

3 Empirical Analyses

3.1 Sample Selection and Industry Classification

An ideal sample for my research question would encompass all firms operating in the product markets within my observation period (1890-1894). Unfortunately, sufficient data coverage is only given for publicly listed firms by the stock market annual *'Saling's Börsenpapiere'* (*SBP*). I acknowledge that ignoring private firms could bias my competition measures (*Ali et al. 2009*). However, *Dedman and Lennox (2009)* show that managers are aware of four to seven competitors even if the number of firms in the industry is ten times higher. Thus, it is already a strong assumption that managers are aware of all publicly listed firms in their industry. Additionally, hand-collecting the available data on some private firms would introduce another level of selection bias into my study since there is no systematic data coverage of private firms for the early 1890s. Hence, I restrict my analyses to publicly listed firms. 14 stock exchanges were operating in Imperial Germany at this time (*Gömmel 1992)*. The Berlin Stock Exchange (BSE) was the most influential one (*Fohlin 2007*). Thus, I expect to capture a sufficient proportion of publicly listed firms by restricting my sample to the BSE. This decision is again motivated by the data coverage of *SBP* and the *BBZ*. I use the stock market list of the BSE that was published daily in the *BBZ* to derive my sample. Table 3 presents this process.

[Table 3 about here]

629 firms were listed on the BSE on December 31, 1895. I choose this date as a starting point since I want my sample firms to be equally exposed to capital market incentives when they publish the annual report for the fiscal year 1894. I exclude 108 banks and 47 insurance companies because I am interested in the effects of product market competition and these industries have special business models. I exclude 74 railway companies because the German government tried to get substantial influence over the railway system aiming at socialization and hence, these firms were exposed to a special external influence. I exclude 68 firms that were not listed on the BSE on January 1, 1890. This is justified by the decision to construct a balanced panel with firms facing the same type of capital market incentives from the preparation of the annual report for the fiscal year 1890 to the publication of the annual report for the fiscal year 1894. Including firms which conducted an IPO within my observation period would add another layer of complexity in capital market incentives, which might hinder the identification of a competition effect. I acknowledge that this procedure could bias the competition measures by ignoring both, capital market entries and exits that could be accompanied by concurrent product market entries and exits. Nevertheless, a balanced panel comes at the advantage of facilitating the identification of potential structural time effects. I also exclude 24 firms that are not (sufficiently) covered by *SBP* and five firms that published their annual reports in foreign currencies. Finally, I exclude 18 firms that are not assigned to an industry by *SBP*. I end up with a final sample of 285 firms. I hand-collect data for these firms for the fiscal years 1890 and 1894 from *SBP Vol. 15 (1891/92)* and *SBP Vol. 19 (1895/96)*.

[Table 4 about here]

I use the industry classification of *SBP Vol. 19 (1895/96)* to assign my sample firms to one out of 17 industries. Table 4 presents this classification. The industry classification in *SBP Vol. 19 (1895/96)* is more detailed than the classification of *SBP Vol. 15 (1891/92)* since it explicitly rec-

ognizes 'mills' as an industry. I follow the more detailed version because I want to identify industries in which firms are preferably homogeneous in their exposure to competition.[11] The three largest industries (mining and steel producer, breweries, engineering and railroad supply) represent almost one half of the sample. The minimum number of firms assigned to an industry is five. This is higher than the restriction made e.g. by *Li (2010)* who excludes industries with less than three firms in order to obtain meaningful industry-average measures.

3.2 Hypotheses Development

Prior studies often assume that competition is uni-dimensional and use market concentration proxies and/or the speed of profit adjustment measure to capture competitive threats (e.g. *Harris 1998*; *Botosan and Stanford 2005; Depoers and Jeanjean 2012; Ali et al. 2014)*. However, competition is a multi-dimensional construct encompassing at least potential competition, existing competition and industry profitability (*Karuna 2007; Li 2010; Dhaliwal et al. 2014*).

Potential competition is generally positively associated with voluntary disclosure (*Wagenhofer 1990; Feltham and Xie 1992; Darrough 1993*). *Darrough and Stoughton 1990* even show that the news' information content is irrelevant for this effect. If the threat of a market entry is high, firms release bad news to deter an entry. However, firms also release good news in this situation since the entrant can infer the good news. Nevertheless, these studies generally assume that the potential entrant is aware of the potential market. *Hayes and Lundholm (1996)* show that firms might also hide (good) news to avoid attraction from potential entrants. This is supported by empirical evidence on segment disclosure (e.g. *Botosan and Stanford 2005*). I follow this perspective on the relationship between potential competition and voluntary disclosure. My sample firms are operating in industries which promise potentially high future rents. I expect that firms want to protect

[11] Five firms are assigned to different industries by *SBP Vol. 15 (1891/92)* and *SBP Vol. 19 (1895/96)*. I analyze these firms in detail and choose one of the industries.

these rents against industry outsiders. These outsiders in turn are facing a dynamic environment that is subject to constantly changing parameters due to a constant technological progress. On the one hand, this might reduce entry barriers since prior investments of incumbents are sunk costs. On the other hand, this also might generate entry barriers since the environment demands a high level of experience and expertise. Considering this, I expect firms to be more opaque to avoid attraction from industry outsiders and to reduce opportunities for these outsiders to learn relevant details about the industry.

H1: Potential competition is negatively associated with voluntary disclosure.

I furthermore expect that this relationship is more pronounced for industry leaders since these firms have a higher market share than industry followers and thus, should be more inclined towards protecting their market position against industry outsiders.

H2: The negative association between potential competition and voluntary disclosure is more pronounced for industry leaders.

In contrast, existing competition is generally perceived to be negatively associated with voluntary disclosure (*Darrough 1993; Clinch and Verrecchia 1997; Fischer and Verrecchia 2004; Arya and Mittendorf 2007). Board (2009)* even shows that existing competition and voluntary disclosure might evolve endogenously. Nevertheless, *Wagenhofer (1990)* and *Verrecchia (2001)* show that even under consideration of competition by rivals a full disclosure equilibrium is always possible. *Huang and Li (2014)* furthermore argue that a high level of existing competition deteriorates the capital market profile of firms which in turn increases the benefits of voluntary disclosure. Consistent with this argument they find a positive association between existing competition and voluntary disclosure in growth industries which are characterized by a broad range of investment opportunities and a high reliance on external financing. I follow this hypothesis since

the industries in my sample are substantially growing (*Hahn 2011*), firms are constantly investing (*Rettig 1978*) and moreover, heavily relying on financing via capital markets (*Franks et al. 2006*).

H3: Existing competition is positively associated with voluntary disclosure.

I furthermore expect this association to be more pronounced for industry followers since these firms have lower market shares and thus, less market power. Essentially being a price taker, these firms are more affected by existing competition and hence the capital market benefits arising from more extensive voluntary disclosure should be higher than for industry leaders.

H4: The positive association between existing competition and voluntary disclosure is more pronounced for industry followers.

The importance of considering competition as a multi-dimensional construct is highlighted once the third dimension, i.e. industry profitability, comes into play. *Nevo (2001) s*hows that industry profitability is an important factor determining the level of competition. Potential entrants are attracted by high profitability. Thus, high industry profitability reflects high potential competition (*Newman and Sansing 1993*). However, industry profitability also reflects the intensity of existing price competition (*Shaked and Sutton 1982)*. Thus, high industry profitability can also reflect low existing competition. Since I expect that high potential (existing) competition is negatively (positively) associated with voluntary disclosure in my setting, I hypothesize that industry profitability is negatively associated with voluntary disclosure

H5: Industry profitability is negatively associated with voluntary disclosure.

I expect that the negative (positive) association between potential (existing) competition and voluntary disclosure is more (less) pronounced for industry leaders. Hence, I expect that the negative relation between industry profitability and voluntary disclosure is more pronounced for industry leaders.

H6: The negative association between industry profitability and voluntary disclosure is more pronounced for industry leaders.

3.3 Measuring Voluntary Disclosure

Prior research is mainly investigating specific components of voluntary disclosure. *Guo et al. (2004)* investigate the extant of product-related information disclosed by biotech firms in IPO prospectuses. *Botosan and Stanford (2005)* investigate segment disclosure decisions. *Verrecchia and Weber (2006)* investigate the decision to redact information from material contract filings. *Li (2010)* investigates management forecasts. These studies provide an intuitive connection between competition and voluntary disclosure. However, the relation between competition and proprietary costs is ambiguous and a potential source for the conflicting evidence. *Lang and Sul (2014)* argue that a certain source of competition, e.g. industry concentration, is not exclusively related to a certain source of proprietary costs, i.e. information about production costs or information about future demand. Thus, different voluntary disclosure instruments can principally be differently affected by the same competitive environment.

To avoid this ambiguity, I analyze the voluntary disclosure strategy in a more general way. *Depoers and Jeanjean (2012)* already expand the narrow focus of prior studies by analyzing the decision to withhold voluntary reporting items in the annual report. Nevertheless, voluntary disclosure within the annual report is again just a small part of the complex voluntary disclosure strategy; at least nowadays. In my setting, however, modern disclosure instruments (e.g. sustainability reports) and communication channels (e.g. the internet) are not present. Hence, I expect the voluntary disclosure in the annual reports of my sample firms to represent a substantially larger extent of the overall voluntary disclosure than nowadays. This is supported by the analyses in section two which conclude that there is no indication of an evolvement of a general and sys-

tematic voluntary reporting over and above the voluntary disclosure provided in the annual reports.

Consequently, my dependent variable reflects voluntary disclosure in the annual reports. In my setting annual reports consist of four components, i.e. a balance sheet, an income statement, corresponding notes and a management report. However, firms only had to publish the balance sheet and the income statement and firms did not voluntarily publish the remaining two financial statements. Since the German commercial code did not stipulate a minimum presentation scheme for financial statements, I follow prior literature on voluntary disclosure in unregulated settings and use the level of disaggregation of financial information as a proxy for voluntary disclosure (*Arnold 1997*; *van Overfelt et al. 2010*).[12] Hence, I count the number of positions reported in the balance sheet and the income statement of each firm. Furthermore, I count the number of positions regarding the net income distribution which was either displayed in the income statement or the balance sheet. Afterwards, I sum up the number of positions reported in the balance sheet and the income statement and subtract the number of positions regarding the net income distribution to construct my dependent variable. The adjustment of the net income distribution is motivated by the fact that otherwise a loss firm would c.p. be treated as a firm with less disaggregated financial information compared to an identical firm with a positive net income. Appendix A gives two examples. Table 5 presents the distribution of my dependent variable.

[Table 5 about here]

On average firms choose to report 36 positions with a standard deviation of 12.39 positions. The variation primarily stems from two sources. First, firms tend to disaggregate their information on assets more than their information on capital. Second, firms tend to disaggregate their information on expenses more than their information on revenues. Some firms do not show their in-

[12] *Chen et al. (2014)* show that the level of disaggregation can serve as a proxy for disclosure quality.

come distribution. This is primarily a technical issue since loss firms do not have an income to distribute. Beyond that, the analyses displayed in table 2 already suggested that some firms do not show their income distribution in the published financial statements for some reason. Nevertheless, the most opaque firm in my sample chooses to report 16 items which is still clearly above the minimum requirement of seven positions. The maximum number of positions reported is 125. Hence, I infer that firms used their freedom in reporting their affairs to the public. I furthermore split the sample into industry leaders and industry followers. A firm is identified as an industry leader if its market share ranks in the upper quartile. Industry followers show on average a statistically significant lower level of disaggregation in their financial statements than industry leaders.

Arguably, this approach might not sufficiently cover the voluntary disclosure in annual reports since it does not consider the management report and the notes. Table 1 shows that the media covered these parts which might also explain the renunciation of firms to voluntarily publish the full annual report. Nevertheless, my approach focuses on disclosure unambiguously initiated by the firms. Hence, it generates an objective basis for my analyses. The consideration of the newspaper articles, however, would require a judgment on the actual content. Nonetheless, the number of lines of the articles is positively and significantly correlated with my dependent variable.[13] This suggests that firms which are more opaque in the balance sheet and the income statement are also more opaque in the rest of the annual report. This supports my assumption that the number of positions reported is a sufficient proxy for the voluntary disclosure provided within the annual report which (in this setting) is a sufficient proxy for the overall voluntary disclosure.

3.4 Measuring Competition

To capture competition, I follow the approach of *Li (2010)* and employ a principal component analysis based on six different proxies. *Karuna (2010)* criticises this variable reduction approach,

[13] Pearson correlation between *BBZ_Lines* and *pos_sum*: 0.2801; Spearman correlation: 0.2535.

but it allows me to consider a broad range of different aspects of competition thereby mitigating econometric issues arising from potential multicollinearity. I use the weighted average of property plant and equipment (*ind_ppe*) in an industry as a proxy for market entry barriers.[14] I use the industry-level sum of revenues (*market_size*) as a proxy for market size. With respect to the market concentration measures I use both, the four firm concentration ratio (*4_firm_conc)* and the Herfindahl-Hirschman Index (*HHI*).[15] I furthermore use the industry-level mean of the return on assets (*ind_roa*) and the industry-level price-cost margin (*ind_pc_mgn*).[16] Table 6 presents descriptive statistics for my competition proxies.

[Table 6 about here]

The industries show an average investment into property, plant, and equipment of 8.43 million Mark.[17] The distribution of *ind_ppe* indicates a moderate variation of this investment across the industries. The market sizes are more heterogeneously distributed. The minimum of *market_size* totals 1.50 million Mark, while the maximum of *market_size* totals 136.96 million Mark. In accordance with *Li (2010)* I use logarithmic values of *market_size* in the following analyses to reduce the influence of extreme values. The industries are also heterogeneous with respect to the market concentration measures. Besides this, even the least profitable industry-year still shows a positive industry-level mean of the return on assets. Likewise the minimum of *ind_pc_mgn* is still above one, which corroborates the perception of very positive conditions across all industries. Table 7 presents the results of the principal component analysis.

[Table 7 about here]

[14] A firm's market share (revenues over industry aggregate revenues) is used as its weight.
[15] The four firm concentration ratio is defined as the sum of revenues of the four largest firms within an industry over the industry's market size. The HHI is defined as the sum of squared market shares of all firms in an industry.
[16] The industry-level price cost margin is defined as industry aggregate revenues over industry aggregate costs. Firm-level operating expenses are total expenses minus extraordinary expenses. Extraordinary expenses are expenses that are extraordinary with respect to their occurrence and/or amount and are manually identified.
[17] *Wehler (1994)* estimates an average annual per-capita income of 505 Mark for the 1890s. Hence, my sample firms are economically meaningful.

Panel A shows that three components have an eigenvalue above one which is suggested as a cut-off point for the usage of principal components. These three components explain 87% of the variance. Panel B shows how my competition proxies load onto the rotated components. All loadings, except the loading of *ind_roa* on PC3, are comparable with those of *Li (2010)*. Hence, I follow her interpretations. PC 2 is positively loaded by *ln_market_size, ind_pc_mgn* and *ind_roa.* Thus, I use this component as a proxy for industry profitability. PC 3 is positively loaded by *ind_ppe* and *ln_market_size* and negatively loaded by *ind_roa*. Hence, I take the negative of PC 3 as a proxy for potential competition. The negative relationship between market size and potential competition is criticised by *Karuna (2010).* He points at studies which identify a greater market size as a source for potential competition because market entries are stimulated by the prospects of an increased profitability (*Raith 2003*). Nevertheless, *Li (2010)* offers a reasonable argument for this loading assuming that a market entry is less harmful for the incumbent, once a market is big enough. This is supported by *Nakao (1980)* who shows that established firms raise prices above the entry-preventing level if demand growth is large enough. In contrast to *Li (2010)* the proxy for potential competition is also positively associated with *ind_roa*. Since a high industry-level mean of return on assets encourages market entries and is thus an indication for high potential competition, I do not dissent on this relation. PC 1 is positively loaded by *4_firm_conc* and *HHI* and negatively loaded by *ln_market_size*. Thus, I take the negative of PC 1 as a proxy for existing competition. Panel C shows the distributions of the three principal components. Table 8 presents a correlation matrix for the competition proxies.

[Table 8 about here]

The correlations between *existing*, *profit* and *potential* and the initial six competition proxies reflect the factor loadings. The partially very high correlations between the six competition proxies justify the principal component analysis. However, the competition dimensions are not independ-

ent of each other. Potential competition is negatively and significantly correlated with existing competition. Once thinking in extreme cases, this correlation is intuitive. A monopolist e.g. does not face existing competition at all but he is vigilant for potential competitors since he wants to keep the monopolistic rents. The negative correlation between existing competition and industry profitability as well as the positive correlation between potential competition and industry profitability is also intuitive as high industry profitability can be explained by both, low existing competition (*Shaked and Sutton 1982)* and high potential competition (*Newman and Sansing 1993).* Table 9 gives an overview on the competition characteristics in each industry and year and the corresponding industry-level average of positions reported.

[Table 9 about here]

Panel A and B reveal that the ranking of existing competition across industries is basically constant over time while the rankings of potential competition and especially industry profitability are relatively volatile. The industry-level averages of positions reported show moderate but still recognizable changes for most of the industries. Panel C reveals that low industry-level averages of positions reported are associated with industries showing low existing competition, high industry profitability and high potential competition. In contrast to this, high industry-level averages of positions reported are associated with industries showing high existing competition and low potential competition. These findings are in line with my hypotheses.

3.5 Firm-level Control Variables

Prior studies on segment reporting find a tendency of firms to hide profitable segments in less competitive industries which is consistent with the proprietary cost hypothesis (*Botosan and Sanford 2005*). In contradiction to that *Berger and Hann (2007)* just find weak evidence for firms hiding highly profitable segments. Instead, they show that firms tend to hide segments with low abnormal profits which they link to agency costs. This is supported by *Hope and Thomas (2008)*

who show that firms which refrain from splitting up their geographical earnings are associated with higher foreign sales and a decrease in the foreign profit margin. They conclude that this is indicative of empire building. Hence, I have to control for agency conflicts. I expect firms to experience more severe ex-ante agency conflicts once they seek for external financing. Thus, I include a binary dummy variable that equals one if the firm raised public equity or debt between January 1, 1890, and December 31, 1895. Prospectuses became regulated by a stock exchange law in 1896 first (*Franks et al. 2006*). However, the BSE required firms to publish information before an SEO and therefore, these firms should disaggregate their information more to attract investors.[18] With respect to ex-post agency conflicts I introduce the asset utilization ratio which is defined as revenues over total assets. Higher values of *asset_utilization* imply more efficiently managed firms and thus, a lower severity of ex-post agency conflicts. I expect managers who run firms more efficiently to be less opaque in their financial reporting. I also use the level of variable compensation over total net income (*var_comp*) since prior literature identifies variable compensation as a mechanism to align the interests of managers and principals (*Jensen and Meckling 1976*).[19] However, recent studies suggest that this tie can work as a double-edged sword since managers might divert firm resources to misrepresent performance (*Goldman and Slezak 2006*). Therefore, I do not have an expectation how variable compensation is related to voluntary disclosure. I also control for firm size by using total assets (*tot_assets*) since I expect firm size to be positively related to the disaggregation of financial information for two reasons. First, I expect larger firms to be more visible and thus more under pressure to be transparent. Second, I expect the relationship for mechanical reasons since larger firms often imply a more complex business and thus more distinct information to report in the first place. Finally, I also control for firm per-

[18] The same applies to potential future public debtholders.
[19] Similarly to dividends, a manager's variable compensation is part of the net income distribution in my setting. See e.g. the income statement of 'Schultheiss Brauerei' in appendix A.

formance by recognizing the return on assets (*roa*) and for the capital structure by recognizing the equity quota (*eq_quota*). Table 10 presents descriptive statistics for my control variables.

[Table 10 about here]

The firms are on average profitable (mean of *roa:* 0.0563) and substantially financed by (public) equity (mean of *eq_quota:* 0.7094). Some firms are almost completely equity financed (maximum of *eq_quota:* 0.9965). Approximately 12.81% of the firms raise additional public equity or debt in the first half of the 1890s (mean of *cap_inc*: 0.2561). Variable compensation is a common tool to incentivize managers. Managers receive on average 10.42% of the net income. However, for 58 firm-years I do not have the income distribution at hand. In 44 firm-years managers do not receive a bonus payment (minimum of *var_comp:* 0.0000). Most of these cases show a low net income, which highlights the rationale of the bonus system. However, the structure of the bonus system seems to vary across firms since in some cases managers' completely received the (low) net income (maximum of *var_comp:* 1.0000). This suggests that some bonus systems might encompass a fixed minimum payment while others do not. Some firms are very inefficiently managed (minimum of *asset_utilization*: 0.0001) while others are very efficiently managed (maximum of *asset_utilization:* 2.6315). The total assets are right-skewed distributed (median of *tot_assets*: 3,770,302 Mark; mean of *tot_assets*: 7,375,330 Mark). Hence, I use logarithmic values of *tot_assets* in the following analyses. Moreover, table 10 shows that industry followers are smaller, less profitable, more equity financed and less inclined towards additional external financing than industry leaders. In addition, the managers of these firms receive on average more bonus compensation but run their firms less efficiently.

3.6 Univariate Associations

This paper analyzes the relation between voluntary disclosure and competition. I take a first step in this analysis by examining univariate associations between my disclosure proxy, the competition proxies and the firm-level control variables. Table 11 presents these associations.

[Table 11 about here]

The number of positions reported is positively correlated with existing competition and negatively correlated with potential competition and industry profitability. These correlations show that it is crucial to define different competition dimensions that can be diametrically related to the dependent variable. The choice to seek for additional external financing is as expected positively related to voluntary disclosure which indicates that managers want to mitigate ex-ante agency conflicts by extensive voluntary disclosure. The asset utilization ratio is also positively related to voluntary disclosure which shows that the severity of ex-post agency conflicts is as expected negatively related to voluntary disclosure. The level of variable compensation is negatively correlated with *pos_sum*. Larger firms are positively associated with voluntary disclosure which is also in line with my expectations. More profitable firms choose to report fewer items. However, the correlations between the competition proxies can be puzzling when comparing them with the industry-level correlation analyses (table 8). While the negative relationship between existing and potential competition persists, the correlation between existing competition and industry profitability is displayed as positive. This is attributable to a different weighting of the industries in the analyses. The industry-level analysis displayed in table 8 assigns the same weight to each industry and hence results in an equally weighted relationship. In contrast to this, the firm-level analysis displayed in table 11 weights the industries according to the number of firms operating in an industry. Table 9 shows that the largest industry (mining and steel producer) is characterized by high existing competition and high industry profitability. This industry accounts for more than ¼

of the firm-years. Hence, the positive correlation between existing competition and industry profitability is driven by this industry which is confirmed by untabulated analyses.

3.7 Firm-Year and Industry-Year Analyses

My final set of analyses encompasses various firm-year regressions that are presented in table 12. Prior studies (e.g. *Li 2010)* often employ industry-year analyses. However, I view voluntary disclosure as a firm-level phenomenon and a major advantage of my stetting is that I am able to measure this disclosure in a very precise way. Industry-level averages would ignore some of this precision and I want to avoid this. Nevertheless, I also conduct an industry-year analysis that supports my results. My research design requires at least two observation periods since I measure competition at the industry-level and focusing on a single year would lead to only 17 different variable attributions for each competition dimension. Thus, I employ GLS regressions since pooled OLS regressions would ignore the panel structure of my dataset.[20] I estimate random effect models. The assumption that the individual heterogeneity is not correlated with the covariates is strong. However, Hausman tests support my decision.

[Table 12 about here]

First, I only include the three competition proxies into the regression. Consistent with my hypotheses, I observe a negative association between potential competition as well as industry profitability and the voluntary disclosure provided by a firm. The association between existing competition and voluntary disclosure is as expected positive.

Model (2) introduces the firm-level control variables. The previously observed associations between the three competition proxies and *pos_sum* are robust against this. However, the association between existing competition and voluntary disclosure becomes insignificant. Since the relationship between *var_comp* and *pos_sum* is statistically insignificant and I do not want to sys-

[20] OLS estimators assume uncorrelated error terms across observations. This is violated in a (balanced) panel.

tematically ignore loss firms, I exclude this control variable in the next step to employ the full sample in model (3).[21] The associations between the competition dimensions and my voluntary disclosure proxy presented in model (2) persist. The firm-level control variables also show the expected associations. Firms with more (less) severe ex-ante (ex-post) agency conflicts disaggregate their financial information more. This also applies to larger firms. Firms that are more profitable choose to be more opaque. The equity quota is negatively related to voluntary disclosure. Summing up, the results suggest a robust negative relationship between the level of potential competition and voluntary disclosure. This relationship is also economically relevant. An increase of one standard deviation in *potential* is associated with a decrease of 1.9 positions reported, which represents 5.3% of the mean number of positions reported. Hence, I accept hypothesis 1. The relationship indicates that firms in growing industries are reluctant to provide voluntary disclosure in a setting in which substantial technological progress gives rise to uncertainty for industry outsiders while industry insiders expect high future rents. This is in line with prior literature (*Hayes and Lundholm 1996*) showing that incumbents refrain from extensive disclosure in cases where potential market entrants are relatively uninformed about the market conditions. I also find evidence that is consistent with hypothesis 5. However, the effect is economically inferior. An increase of one standard deviation in *profit* is associated with a decrease of 0.5 positions reported which represents only 1.3% of the mean number of positions reported. With respect to hypothesis 3, I only find evidence that is not robust against the alternative explanations.

Model (5) - (8) show sub-sample analyses for industry leaders and industry followers. The negative relationship between potential competition and voluntary disclosure is more pronounced for industry leaders. An increase of one standard deviation in *potential* is associated with a decrease of 3.1 positions reported which represents 7.7% of the mean number of positions reported for

[21] However, model (9) shows a statistically significant negative association between variable compensation and voluntary disclosure at the industry-level.

these firms. In contrast to this, the relationship between potential competition and voluntary disclosure is statistically insignificant for industry followers. This is in line with the expectation that industry leaders are more reluctant to publish information that might attract additional competitors which in turn might threaten their market power and their ability to exploit future rents. The negative interaction effect between *potential* and *leader* in model (4) supports this conclusion. Hence, I accept hypothesis 2.

The relation between existing competition and voluntary disclosure is more pronounced for industry followers. The association is statistically insignificant for industry leaders while an increase of one standard deviation in *existing* is associated with an increase of 1.5 positions reported by industry followers. This represents 4.3% of the mean number of positions reported which is economically not substantial, but still recognizable. Industry followers are essentially price takers and thus, more affected by existing competition. The results are consistent with the expectation that this worsens the capital market profile of these firms on the one hand, but increases the benefits of voluntary disclosure on the other hand. Hence, I accept hypothesis 4. However, the interaction effect between *existing* and *leader* in model (4) is insignificant.

Moreover, the results show that the negative association between industry profitability and voluntary disclosure is more pronounced for industry leaders. An increase of one standard deviation in *profit* is associated with a decrease of 1.8 positions reported which represents 4.4% of the mean number of positions reported of these firms. In contrast, the association is economically insignificant for industry followers. An increase of one standard deviation in *profit* is only associated with a decrease of 0.3 positions reported which represents 1.0% of the mean numbers reported for these firms. This indicates that industry leaders are less willing to reveal firm-specific conditions in highly profitable industries. The interaction effect between *profit* and *leader* in model (4) supports this conclusion. Hence, I accept hypothesis 6.

4 Conclusion

This study adds to the literature on the relationship between competition and voluntary disclosure. By investigating the financial reports of 285 publicly listed firms in Imperial Germany for the fiscal years 1890 and 1894, I find a significant negative association between the firms' decision to disaggregate financial information and the competitive threats arising from potential competition and industry profitability. In contrast, the association between existing competition and voluntary disclosure is positive. Industry leaders' voluntary disclosure is statistically and economically significantly negatively related to potential competition and industry profitability, while existing competition does not play a statistically significant role for their voluntary disclosure strategy. On the other hand the voluntary disclosure strategy of industry followers is statistically and economically only related to existing competition.

The setting comes at two major advantages. First, the setting allows an analysis of the relationship between voluntary disclosure and competition in general, while prior research predominantly focuses on special cases of disclosure. Second, the setting entails a competitive environment that shows extreme characteristics which result in more pronounced relations between competition and the voluntary disclosure provided by firms. Considering this, I am able to support the evidence on segment reporting (e.g. *Botosan and Stanford 2005*) by showing a negative relationship between potential competition and voluntary disclosure in industries that are characterized by potentially high future rents for industry insiders and high uncertainty of industry outsiders with respect to the market conditions. Furthermore, I am able to support the findings of *Huang and Li (2014)* that firms in growing industries provide more extensive voluntary disclosure if they face competition by rivals.

However, the study also contains at least two major shortcomings. First, I am only able to show associations between competition and voluntary disclosure. A causal analysis of the relationship, however, requires further progress on the empirical methods to sufficiently capture the competitive environment. *Karuna (2010)* for example points out that the method employed in this study does not distinguish between price and non-price competition. Second, this study only analyses the relationship between the level of competition and the level of voluntary disclosure. Thus, a change analysis should be performed by future research. *Burks et al. (2013)* for example show that exogenous shocks in competition are related to changes in voluntary disclosure. However, a reasonable change analysis should at least comprise a third observation period. Additional periods would also help to corroborate the results of this study.

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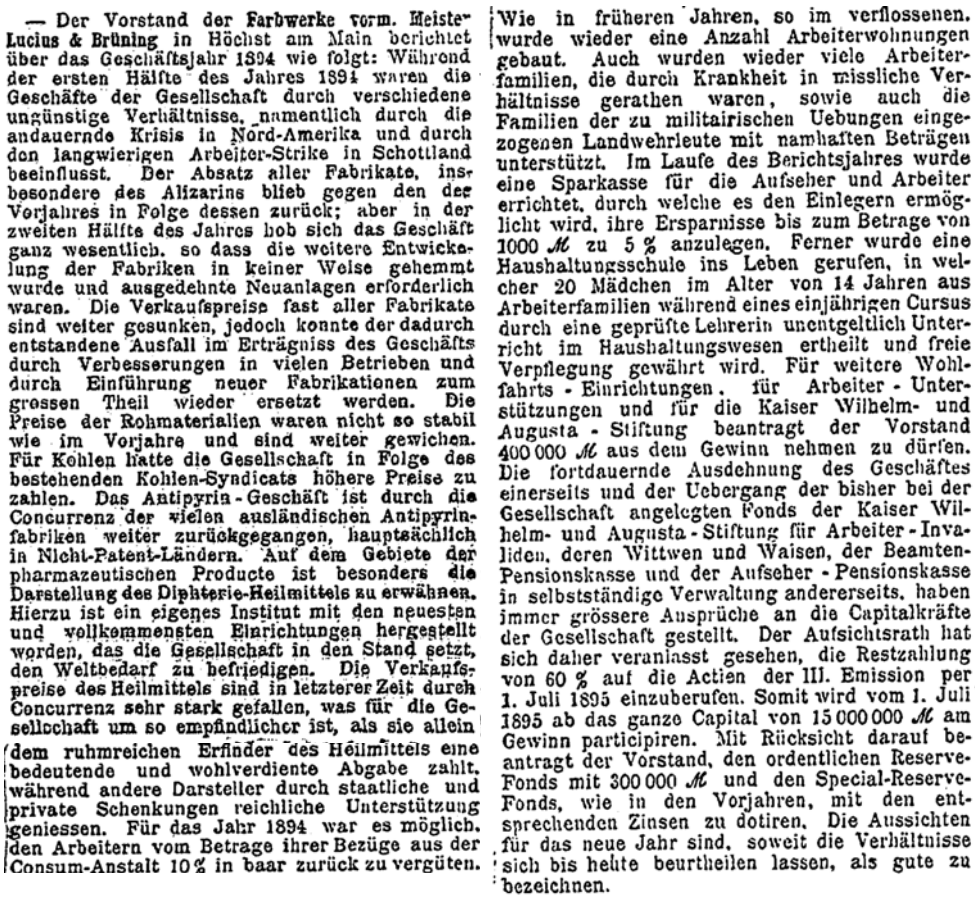
Appendix A

I. Höchster Farbwerke (vorm. Meister Lucius & Brüning)

- Industry: Chemical Factories
- Fiscal Year End: December 31st 1894
- Dividend Announcement: April 6th 1895
- Shareholder Meeting Announcement: April 6th 1895
- Media Coverage of the Annual Report: April 17th 1895



— Der Vorstand der Farbwerke vorm. Meister Lucius & Brüning in Höchst am Main berichtet über das Geschäftsjahr 1894 wie folgt: Während der ersten Hälfte des Jahres 1894 waren die Geschäfte der Gesellschaft durch verschiedene ungünstige Verhältnisse, namentlich durch die andauernde Krisis in Nord-Amerika und durch den langwierigen Arbeiter-Strike in Schottland beeinflusst. Der Absatz aller Fabrikate, insbesondere des Alizarins blieb gegen den der Vorjahres in Folge dessen zurück; aber in der zweiten Hälfte des Jahres hob sich das Geschäft ganz wesentlich, so dass die weitere Entwickelung der Fabriken in keiner Weise gehemmt wurde und ausgedehnte Neuanlagen erforderlich waren. Die Verkaufspreise fast aller Fabrikate sind weiter gesunken, jedoch konnte der dadurch entstandene Ausfall im Erträgniss des Geschäfts durch Verbesserungen in vielen Betrieben und durch Einführung neuer Fabrikationen zum grossen Theil wieder ersetzt werden. Die Preise der Rohmaterialien waren nicht so stabil wie im Vorjahre und sind weiter gewichen. Für Kohlen hatte die Gesellschaft in Folge des bestehenden Kohlen-Syndicats höhere Preise zu zahlen. Das Antipyrin-Geschäft ist durch die Concurrenz der vielen ausländischen Antipyrinfabriken weiter zurückgegangen, hauptsächlich in Nicht-Patent-Ländern. Auf dem Gebiete der pharmazeutischen Producte ist besonders die Darstellung des Diphterie-Heilmittels zu erwähnen. Hierzu ist ein eigenes Institut mit den neuesten und vollkommensten Einrichtungen hergestellt worden, das die Gesellschaft in den Stand setzt, den Weltbedarf zu befriedigen. Die Verkaufspreise des Heilmittels sind in letzterer Zeit durch Concurrenz sehr stark gefallen, was für die Gesellschaft um so empfindlicher ist, als sie allein dem ruhmreichen Erfinder des Heilmittels eine bedeutende und wohlverdiente Abgabe zahlt, während andere Darsteller durch staatliche und private Schenkungen reichliche Unterstützung geniessen. Für das Jahr 1894 war es möglich, den Arbeitern vom Betrage ihrer Bezüge aus der Consum-Anstalt 10 % in baar zurück zu vergüten. Wie in früheren Jahren, so im verflossenen, wurde wieder eine Anzahl Arbeiterwohnungen gebaut. Auch wurden wieder viele Arbeiterfamilien, die durch Krankheit in missliche Verhältnisse gerathen waren, sowie auch die Familien der zu militairischen Uebungen eingezogenen Landwehrleute mit namhaften Beträgen unterstützt. Im Laufe des Berichtsjahres wurde eine Sparkasse für die Aufseher und Arbeiter errichtet, durch welche es den Einlegern ermöglicht wird, ihre Ersparnisse bis zum Betrage von 1000 ℳ zu 5 % anzulegen. Ferner wurde eine Haushaltungsschule ins Leben gerufen, in welcher 20 Mädchen im Alter von 14 Jahren aus Arbeiterfamilien während eines einjährigen Cursus durch eine geprüfte Lehrerin unentgeltlich Unterricht im Haushaltungswesen ertheilt und freie Verpflegung gewährt wird. Für weitere Wohlfahrts-Einrichtungen, für Arbeiter-Unterstützungen und für die Kaiser Wilhelm- und Augusta-Stiftung beantragt der Vorstand 400 000 ℳ aus dem Gewinn nehmen zu dürfen. Die fortdauernde Ausdehnung des Geschäftes einerseits und der Uebergang der bisher bei der Gesellschaft angelegten Fonds der Kaiser Wilhelm- und Augusta-Stiftung für Arbeiter-Invaliden, deren Wittwen und Waisen, der Beamten-Pensionskasse und der Aufseher-Pensionskasse in selbstständige Verwaltung andererseits, haben immer grössere Ansprüche an die Capitalkräfte der Gesellschaft gestellt. Der Aufsichtsrath hat sich daher veranlasst gesehen, die Restzahlung von 60 % auf die Actien der III. Emission per 1. Juli 1895 einzuberufen. Somit wird vom 1. Juli 1895 ab das ganze Capital von 15 000 000 ℳ am Gewinn participiren. Mit Rücksicht darauf beantragt der Vorstand, den ordentlichen Reserve-Fonds mit 300 000 ℳ und den Special-Reserve-Fonds, wie in den Vorjahren, mit den entsprechenden Zinsen zu dotiren. Die Aussichten für das neue Jahr sind, soweit die Verhältnisse sich bis heute beurtheilen lassen, als gute zu bezeichnen.

'The management of the **Farbwerke vorm. Meister Lucius & Brüning** in Höchst am Main reports about the fiscal year 1894 as follows: During the first half of the year 1894, the business of the company was influenced by several unfavorable circumstances, namely the persisting crisis in Northern America and the ongoing strike of workers in Scotland. The sales of all products, particularly that of alizarin fell short of the results of the previous year; fortunately, the business improved significantly during the second half of the year, such that the development of the factories was not constrained at all and the widespread new installations were necessary. The prices of all products continued to decline, however, the resulting reduction in revenue could largely be offset by improvements in many factories and the introduction of new products. The prices of raw materials were not as stable as during the previous year and continued to decrease. Higher prices for coal had to be paid due to the existing syndicate for coal. The antipyrin business continued recede due to competition by many foreign antipyrin factories, mainly from non-patent-countries. In the area of pharmaceutical products particularly the development of the remedy for diphtheria needs to be mentioned. For this purpose, an institute with the newest and most complete equipment was erected, which will allow the company to satisfy global demand. Recently, due to competition, the price for the remedy has been decreasing strongly which affects the company in particular because the company continues to pay the glorious inventor of the remedy a significant and well-deserved royalty while other parties enjoy ample support by public or private dona-

tions. For the year 1894 it was possible to grant the workers a payment of the value of 10 per cent of their wage in cash. Similar as in previous years, a number of workman's houses were built. Also, many families of workers who got into difficulties due to disease as well as those of workers who were drawn in for military exercises were supported with considerable amounts. During the fiscal year, a savings bank for foremen and workers was established which allows the depositors to earn an interest of 5 per cent on a value of up to 1,000 Mark. Additionally, a domestic science school was erected in which 20 girls of the age of 14 years from workers' families are instructed by a certified teacher in a year-long course in domestic science and are supplied with free meals. For investments in further social establishments, in the support of workers, and in the *Kaiser Wilhelm- und Augusta-foundation*, the management requests the use of 400,000 Mark of the current profits. The continuing expansion of the business on the one hand and the transition of the so far established fund of the *Kaiser Wilhelm- und Augusta-foundation* for disabled workers, their widows and orphans, the officers pension fund, and the foremen pension to self-contained administration on the other hand have required ever-increasing funds from the company. The supervisory board has therefore felt obliged to demand the remaining payment of 60 per cent on the shares issued during the third issue of shares on July 1, 1895. Due to this, from July 1, 1895 onwards, the whole full value of equity of 15,000,000 Mark will participate in the earnings. Considering this the management files for the endowment of the general reserves with 300,000 Mark and the special reserves, as in the previous year, with the corresponding interest. The prospects for the upcoming year are, as far as it can be assessed today, positive."

- Shareholder Meeting: May 4th 1895
- Publication of the Balance Sheet and Income Statement: May 6th 1895

Farbwerke vorm. Meister Lucius & Brüning.

Bilanz vom 31. December 1894.

Activa.

	Anlage	Amortisation M. L. & B.	Amortisation von 1860 bis 1894 incl.	Buchwerth am 31. December 1894	
	ℳ pf.	ℳ pf.	ℳ pf.	ℳ pf.	ℳ pf.
1) Fabrik-Anlagen:					
a) Grundstücke (725 862 □Meter)	657 463 69	— —	745 06	656 718 63	
b) Fabrik-Gebäude (134 560 □Meter unter Dach)	6 004 759 47	755 921 42	2 740 772 65	2 508 065 40	
c) Apparate, Maschinen und Transport-Material	13 603 500 56	2 097 122 60	10 511 341 49	995 036 47	
d) Wasserwerk, Gaswerk und Maschinen der mechan. Werkstätte	1 335 462 54	108 411 91	858 100 63	368 950 —	
e) Bahn-Anlagen (18½ Kilometer)	477 701 83	— —	287 353 83	190 348 —	
f) Beamten- und Arbeiter-Wohnhäuser (354 Wohnungen und 3 Schlafsäle)	2 336 812 03	60 902 94	1 360 355 59	915 053 50	
	24 415 700 12	3 022 358 87	15 759 169 25	5 634 172 —	5 634 172 —
2) Waaren, Betrieb, Fabrikation und auswärtige Lager					9 352 261 04
3) Cassa, Wechsel und Effecten					3 355 579 47
4) Debitoren, Ausstände und Guthaben bei Banquiers					6 417 149 48
					24 759 161 99

Passiva.

	ℳ pf.
1) Actien-Capital:	
I. u. II. Emission, 10 000 Actien à ℳ 1000.— ℳ 10 000 000.—	
III. Emission, 5000 Actien à ℳ 1000.— mit 40 % Einzahlung „ 2 000 000.—	12 000 000 —
2) Kaiser Wilhelm- und Augusta-Stiftung für Arbeiter-Invaliden und Waisen (Gesammt-Vermögen der Stiftung per 31. December 1894 ℳ 752 590. 94)	38 341 92
3) Beamten-Pensions-Fonds (Gesammtvermögen der Kasse per 31. December 1894 ℳ 660 324. 97)	30 999 97
4) Aufseher-Pensions-Fonds (Gesammtvermögen der Kasse per 31. December 1894 „ 125 476. 81)	51 695 60
5) Special-Reserve-Fonds: Aus den Erträgnissen 1880/1884 und 1890/1893 zurückgestellte Reserve	2 107 500 —
6) Reserve-Fonds: Aus den Erträgnissen 1885/1889 zurückgestellte ordentliche Reserve	1 200 000 —
7) Dividenden-Conto 1892: Unerhobene Dividende	520 —
8) Dividenden-Conto 1893: Unerhobene Dividende	4 200 —
9) Creditoren	3 213 512 52
10) Gewinn	6 112 391 98
	24 759 161 99

Soll. Gewinn- und Verlust-Conto 1894. Haben.

	ℳ pf.		ℳ pf.
An Amortisations-Conto	1 514 383 03	Per Vortrag von 1893	998 868 78
„ Conto für zweifelhafte Ausstände	8 285 18	„ Diverse	7 107 631 10
„ Arbeiter-Menage-Conto, Zuschuss	25 008 75		
„ Beamten- und Arbeiter-Unfall-Versicherungs-Prämien	58 298 49		
„ Aufseher- und Arbeiter-Gratificationen	51 363 —		
„ Invaliditäts- und Alterversorgungs-Prämien etc.	37 123 53		
„ Staats- und Communalsteuern	299 645 92		
„ Bilanz-Conto	6 112 391 98		
	8 106 499 83		8 106 499 88

Farbwerke vorm. Meister Lucius & Brüning.
Balance sheet as of December 31, 1894

Assets.

1) Factories	Historical costs	Aggregated depreciation of M. L. & B. (prior to 1880)	Aggregated depreciation from 1880 to 1894	Book value as of December 31, 1894	
a) Properties (725 862 sqm)	657 463.69	-	745.06	656 718.63	
b) Factory buildings (134 560 sqm under rooftop)	6 004 759.47	755 921.42	2 740 772.65	2 508 065.40	
c) Machines and transportation material	13 603 500.56	2 097 122.60	10 511 341.49	995 036.47	
d) Waterworks, gasworks, and machines of the mechanical shop	1 335 462.54	108 411.91	858 100.63	368 950.00	
e) Train facilities (18.5 km)	477 701.83	-	287 353.83	190 348.00	
f) Officers' and workers' houses (354 houses and 3 dormitories)	2 336 812.03	60 902.94	1 360 355.59	915 053.50	
	24 415 700.12	3 022 358.87	15 758 669.25	5 634 172.00	5 634 172.00
2) Wares, business, production, and external stock					9 352 261.04
3) Cash, acceptances, and securities					3 355 579.47
4) Accounts receivable and cash at bank					6 417 149.48
					24 759 161.99

Equity & Liabilities.

1) Issued capital		
Issuances I and II, 10 000 shares at M 1000.-	10 000 000.00	
Issuance III, 5000 shares at M 1000.- with 40 % payment	2 000 000.00	12 000 000.00
2) Kaiser Wilhelm- und Augusta-foundation for disabled workers and orphans (total assets of the foundation as of Dec 31, 1894 M 752 590.94)		38 341.92
3) Officers' pension fund (total assets of the fund as of Dec 31, 1894 M 660 324.97)		30 999.97
4) Foremen's pension fund (total assets of the fund as of Dec 31, 1894 M 125 476.81)		51 695.60
5) Special reserves		
Retained earnings from 1880/1884 and 1890/1893		2 107 500.00
6) General reserves		
Retained earnings from 1885/1889		1 200 000.00
7) Dividents account 1892:		
Unpaid dividends		520.00
8) Dividends account 1893:		
Unpaid dividends		4 200.00
9) Accounts payable		3 213 512.52
10) Earnings		6 112 391.98
		24 759 161.99

Income statement 1894.

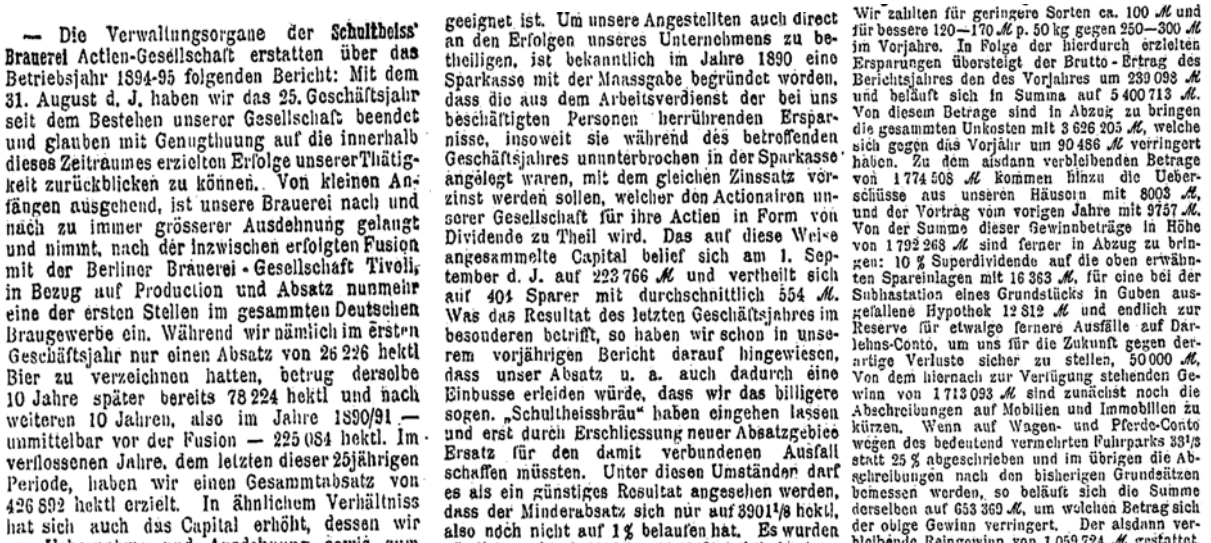
Debit.			**Credit.**
Depreciations	1 514 383.03	Profit carried forward from 1893	998 868.78
Uncollectible receivables	8 285.18	Various	7 107 631.10
Grants for workmen's houses	25 008.75		
Officers' and workmen's casualty insurance premium	58 293.49		
Foremen and worker wages	51 363.00		
Disability and old-age pension premiums etc.	37 123.33		
State and community taxes	299 645.92		
Earnings	6 112 391.98		
	8 106 494.68		8 106 499.88

Construction of Voluntary Disclosure Proxy

Asset Positions	9
Capital Positions	+ 11
Positions on Expenses	+ 8
Positions on Revenues	+ 2
Positions on Income Distribution	- 0
= Positions in Total	**= 30**

II. Schultheiss Brauerei

- Industry: Breweries
- Fiscal Year End: August 31st 1895
- Dividend Announcement: October 10th 1895
- Shareholder Meeting Announcement: October 23rd 1895
- Media Coverage of the Annual Report: November 1st 1895



— Die Verwaltungsorgane der **Schultheiss' Brauerei** Actien-Gesellschaft erstatten über das Betriebsjahr 1894-95 folgenden Bericht: Mit dem 31. August d. J. haben wir das 25. Geschäftsjahr seit dem Bestehen unserer Gesellschaft beendet und glauben mit Genugthuung auf die innerhalb dieses Zeitraumes erzielten Erfolge unserer Thätigkeit zurückblicken zu können. Von kleinen Anfängen ausgehend, ist unsere Brauerei nach und nach zu immer grösserer Ausdehnung gelangt und nimmt, nach der inzwischen erfolgten Fusion mit der Berliner Brauerei-Gesellschaft Tivoli, in Bezug auf Production und Absatz nunmehr eine der ersten Stellen im gesammten Deutschen Braugewerbe ein. Während wir nämlich im ersten Geschäftsjahr nur einen Absatz von 26 226 hektl Bier zu verzeichnen hatten, betrug derselbe 10 Jahre später bereits 78 224 hektl und nach weiteren 10 Jahren, also im Jahre 1890/91 — unmittelbar vor der Fusion — 225 084 hektl. Im verflossenen Jahre, dem letzten dieser 25jährigen Periode, haben wir einen Gesammtabsatz von 426 892 hektl erzielt. In ähnlichem Verhältniss hat sich auch das Capital erhöht, dessen wir zur Uebernahme und Ausdehnung sowie zum Betriebe des Unternehmens bedurften. Bei der im Jahre 1871 stattgefundenen Begründung der Gesellschaft war die Ausgabe von 3000 Actien à 300 ℳ = 900 000 ℳ vorgesehen; jetzt repräsentirt unser Actiencapital den Betrag von 6 000 000 ℳ. Dagegen hat sich die Rentabilität des jeweiligen Capitals im Verlaufe dieser Zeit wesentlich gesteigert. In den ersten Jahren unserer Thätigkeit konnten wir nur 6—8% Dividende zur Vertheilung bringen; in den letzten Jahren belief sich dieselbe zwischen 12 — 16%. Wenn wir für das mit dem 31. August abgelaufene 25. Geschäftsjahr die Vertheilung einer Dividende von 14 Procent in Vorschlag bringen, so glauben wir ohne Ueberhebung aussprechen zu dürfen, dass sich auch dieses Jahr um so würdiger an seine Vorgänger anreiht, als die inzwischen erfolgte Erhöhung des Actiencapitals kaum eine so hohe Verzinsung erwarten liess. Aber nicht nur den Actionairen, sondern auch den Angestellten unserer Gesellschaft ist die günstige Entwickelung des Unternehmens zu Statten gekommen. Fast sämmtliche Löhne haben sich innerhalb dieses Zeitraumes um mehr als 50% erhöht, die Arbeitszeiten sind verkürzt und ausserdem ist eine Reihe von Einrichtungen geschaffen worden, welche die wirthschaftliche Lage unserer Arbeitnehmer wesentlich zu heben geeignet ist. Um unsere Angestellten auch direct an den Erfolgen unseres Unternehmens zu betheiligen, ist bekanntlich im Jahre 1890 eine Sparkasse mit der Maassgabe begründet worden, dass die aus dem Arbeitsverdienst der bei uns beschäftigten Personen herrührenden Ersparnisse, insoweit sie während des betreffenden Geschäftsjahres ununterbrochen in der Sparkasse angelegt waren, mit dem gleichen Zinssatz verzinst werden sollen, welcher den Actionairen unserer Gesellschaft für ihre Actien in Form von Dividende zu Theil wird. Das auf diese Weise angesammelte Capital belief sich am 1. September d. J. auf 223 766 ℳ und vertheilt sich auf 404 Sparer mit durchschnittlich 554 ℳ. Was das Resultat des letzten Geschäftsjahres im besonderen betrifft, so haben wir schon in unserem vorjährigen Bericht darauf hingewiesen, dass unser Absatz u. a. auch dadurch eine Einbusse erleiden würde, dass wir das billigere sogen. „Schultheissbräu" haben eingehen lassen und erst durch Erschliessung neuer Absatzgebiete Ersatz für den damit verbundenen Ausfall schaffen müssten. Unter diesen Umständen darf es als ein günstiges Resultat angesehen werden, dass der Minderabsatz sich nur auf 3901⅛ hektl, also noch nicht auf 1% belaufen hat. Es wurden nämlich verkauft 1893/94 430 793⅜ hektl, im letzten Jahre nur 426 892⅛ hektl. Dagegen ist auch in diesem Jahre der Absatz von Flaschenbier nichts unbedeutend gestiegen. Derselbe betrug 104 271½ hektl gegen 94 547⅜ hektl im Vorjahre, hat also um 9723⅝ hektl oder ca. 10% zugenommen. Da der Ertrag, den wir beim Verkauf von Flaschenbier erzielen, ein höherer ist als beim Fassbier, so werden wir uns die Pflege dieses Zweiges unserer Thätigkeit auch fernerhin angelegen sein lassen. Die Gesammteinnahmen, soweit sie aus dem Verkauf von Bier und Nebenproducten herrühren, beliefen sich im verflossenen Jahre auf 8 229 524 Mark, gegen 8 247 293 ℳ im Vorjahre, haben sich also nur um 17 769 Mark verringert. Auch dieser günstige Umstand ist auf die Entwickelung des Flaschenbiergeschäfts zurückzuführen, indem die Einnahmen desselben von 2 242 200 ℳ im Vorjahre auf 2 493 702 ℳ oder um 251 502 ℳ gestiegen sind. Unsere Malzproduction zuzüglich der Vorräthe vom Vorjahr reichte für das von uns verbraute Quantum aus, so dass wir fertiges Malz nicht zu kaufen brauchten, vielmehr einen fast ebenso grossen Vorrath wie im Vorjahr mit in das neue Geschäftsjahr hinübernehmen konnten. Die zu dieser Malzproduction benöthigten 98 355 Doppel-Centner Gerste konnten wir uns in besserer Qualität und im Durchschnitt zu einem um 7 ℳ p. 1000 kg geringeren Preise als im Jahre 1893/94 beschaffen. Auch Hopfen war wesentlich billiger als im vorhergehenden Geschäftsjahre. Wir zahlten für geringere Sorten ca. 100 ℳ und für bessere 120—170 ℳ p. 50 kg gegen 250—300 ℳ im Vorjahre. In Folge der hierdurch erzielten Ersparungen übersteigt der Brutto-Ertrag des Berichtsjahres den des Vorjahres um 239 098 ℳ und beläuft sich in Summa auf 5 400 713 ℳ. Von diesem Betrage sind in Abzug zu bringen die gesammten Unkosten mit 3 626 205 ℳ, welche sich gegen das Vorjahr um 90 486 ℳ verringert haben. Zu dem alsdann verbleibenden Betrage von 1 774 508 ℳ kommen hinzu die Ueberschüsse aus unseren Häusern mit 8003 ℳ, und der Vortrag vom vorigen Jahre mit 9757 ℳ. Von der Summe dieser Gewinnbeträge in Höhe von 1 792 268 ℳ sind ferner in Abzug zu bringen: 10% Superdividende auf die oben erwähnten Spareinlagen mit 16 363 ℳ, für eine bei der Subhastation eines Grundstücks in Guben ausgefallene Hypothek 12 812 ℳ und endlich zur Reserve für etwaige fernere Ausfälle auf Darlehns-Conto, um uns für die Zukunft gegen derartige Verluste sicher zu stellen, 50 000 ℳ. Von dem hiernach zur Verfügung stehenden Gewinn von 1 713 093 ℳ sind zunächst noch die Abschreibungen auf Mobilien und Immobilien zu kürzen. Wenn auf Wagen- und Pferde-Conto wegen des bedeutend vermehrten Fuhrparks 33⅓ statt 25% abgeschrieben und im übrigen die Abschreibungen nach den bisherigen Grundsätzen bemessen werden, so beläuft sich die Summe derselben auf 653 369 ℳ, um welchen Betrag sich der obige Gewinn verringert. Der alsdann verbleibende Reingewinn von 1 059 724 ℳ gestattet, wie bereits oben erwähnt, die Vertheilung einer Dividende von 14% auf das gesammte gegen das Vorjahr um 600 000 ℳ erhöhte Actiencapital und dürfte somit wie folgt zu vertheilen sein: Zu Unterstützungen und Remunerationen 50 000 Mark, Tantièmen 157 495 ℳ, Dividende 14% auf 6 000 000 = 840 000 ℳ und Vortrag auf neue Rechnung 12 229 ℳ. Die im December v. J. zur Vermehrung unserer Betriebsmittel ausgegebenen 600 Stück neuen Actien à 1000 ℳ sind bis auf einen Rest von 49 Stück von unseren Herren Actionairen zu dem festgesetzten Course von 150% übernommen worden. Der hierbei erzielte Coursgewinn ist den gesetzlichen Bestimmungen entsprechend dem Reservefonds zugeflossen, welcher dadurch auf 2 140 180 ℳ angewachsen ist. Der Erlös dieser Emission im Betrage von rund 900 000 ℳ hat unsere Betriebsmittel derartig gestärkt, dass dieselben auch für den Fall einer weiteren Ausdehnung unseres Unternehmens ausreichen und wir eines Bankcredits für absehbare Zeit nicht mehr bedürfen werden. Was die Aussichten für das mit dem 1. September begonnene 26. Geschäftsjahr betrifft, so sind dieselben in Bezug auf die Beschaffung der Rohproducte nicht so günstig wie im Vorjahr, indem sowohl Gerste wie Hopfen im Preise gestiegen sind. Dagegen scheint sich der Absatz im laufenden Jahre günstiger gestalten zu wollen, sofern man berechtigt ist, aus dem Verlaufe der ersten Monate Schlüsse auf das ganze Geschäftsjahr zu ziehen. Es ist hierbei allerdings zu berücksichtigen, dass die Witterung in den Monaten September und October d. J. dem Bierconsum günstig war, dass andererseits aber auch Störungen, wie sie die letzten Jahre mit sich brachten, kaum zu erwarten sind.

'The administrative body of **the Schultheiss' Brauerei** Actien-Gesellschaft reports the following for the fiscal year 1894-95: On August 31st of the current year, the 25th business year since the foundation of our company has ended and we believe that we can look back on the achieved successes of our operations in this period with satisfaction. Starting in small scale, our brewery has been continuously expanding and now takes, after the succeeded fusion with the Berliner Brauerei-Gesellschaft Tivoli, one of the leading positions in the German brewery industry with regards to production and sales volumes. While we could only register a sales volume of 26 226 hectoliters in the first fiscal year, the sales volume already increased to 78 244 hectoliters 10 years later and after another 10 years, thus in the

year 1890/91 - immediately before the fusion – it amounted to 225 084 hectoliters. In the elapsed year, the last of this 25 years period, we achieved sales of 426 892 hectoliters. In similar proportions, the capital, which was needed for acquisition and expansion as well as the operation of the business, has been continuously increasing. During the company's foundation in 1871, the emission of 3000 shares at 300 M each = 900 000 M was scheduled; now our company's common stock capital amounts to 6 000 000 M. Unaffected, the rate of return on the capital has significantly improved over the years. In the first years of our operations, we were able to issue dividends of mere 6-8%; in the last years dividend yield amounted to 12-16%. When we suggest a payment of a dividend of 14 per cent for the 25th fiscal year, ending on August 31st, we believe that we can state without hubris that this year will follow its predecessors worthily, as the executed increase of stock capital did not allow for an expectation of such a high yield. However, not only our shareholders, but also the employees of our company have been profiting from the favorable development of our company. Almost all wages have increased by more than 50% during the time period, working hours have decreased and in addition, several establishments were erected which allow to improve the economic situation of our employees significantly. To let our employees participate directly in the success of our company, as is known, a savings bank has been founded in 1890 which pays an interest equivalent to the paid dividends, given that the savings come from the employees' wages and are left in the deposit for the whole fiscal year. The collected capital amounted to 223 766 M as of September 1st of the current year and is distributed across 404 savers with an average 554 M. Concerning the results of the elapsed fiscal year in particular, we have already noted in our report for the previous year that our sales would suffer losses also because of the termination of the cheaper so-called 'Schultheissbräu" and the need to first access new markets to compensate for this. Under these circumstances, it can be regarded as a favorable result that the reduction in sales amounted to 3901 1/8 hectoliters, thus less than 1%. In 1893/94, 430 793 3/8 hectoliters were sold compared to 426 892 2/8 hectoliters for the elapsed year. Contrary to that, the sales in bottled beer continued to increase significantly. They amounted to 104 271 1/8 hectoliters compared to 94 547 3/8 hectoliters in the previous year, it thus increased by 9723 6/8 hectoliters or about 10%. Since the margin that we obtain from the sales of bottled beer is higher than that of draft beer, we will continue to attend to this branch of our operations. The total sales from beer and co-products amounted to 8 229 524 Mark, compared to 8 247 293 M in the previous year, they thus decreased by 17 769 Mark. This favorable situation can also be attributed to the business of bottled beers whose sales increased from 2 242 200 M in the previous year to 2 493 702 M, thus by 251 502 M. Our malt production including the stocks from the previous year sufficed for the brewed volume such that we did not need to buy fabricated malt, in fact, the stocks for the new fiscal year are almost as large as the stocks at the end of the last fiscal year. We were able to purchase the 93 355 double-hundredweights of barley needed for the malt production in a better quality and at an on average 7 M per 1000 kg lower price than in the period 1893/94. Similarly, hops were substantially cheaper than in the previous years. We paid about 100 M for lower quality types and 120-170 M per 50 kg for higher quality types, compared to 250-300 M in the previous year. As a result of the hereby achieved cost reductions, the gross profit of the reporting period exceeds the one of the previous period by 239 098 M and amounts to a total of 5 400 713 M. From this amount, total expenses of 3 626 205 need to be deducted, a reduction of 90 486 M compared to the previous year. To the remaining value of 1 774 508 M, the profits of 8003 M from our houses and the profit carried forward of the previous year of 9757 M need to be added. From the sum of 1 792 268 M, the following need to be deducted: 10% additional dividends on the above-mentioned savings at a value of 16 363 M, the default on a mortgage of 12 812 M due to the judicial sale of a property in Guben and 50 000 M as a deposit in the reserve for potential future defaults on loans to insure us against such losses. From the remaining profits of 1 713 093 M, the depreciation on movables and immovables needs to be deducted. Due to a significant enlargement of the fleet, 33 1/3% instead of 25% are depreciated, all other depreciations are conducted in line with previous convention which results in total depreciations of 653 369 M which is by how much the above-mentioned profits decrease. The remaining profit of 1 059 724 M allows, as mentioned above, for the payment of a dividend of 14% on the total, compared to the previous year by 600 000 M increased, stock capital and will therefore be used as follows: For support and remuneration 50 000 Mark, bonuses 157 495 M, dividends 14% on 6 000 000 = 840 000 M and profit carried forward of 12 229 M. The 600 shares at 1000 M issued in December of the previous year to increase our operating funds were, except for 49 remaining shares, bought by our shareholders at the arranged rate of 150%. The gained capital surplus is, according to the law, included in the general reserve fund due to which it increased to 2 140 180 M. The revenue from this emission of about 900 000 M has strengthened our operating funds

such that they will suffice also for the case of a further expansion of the business so that we will not require bank loans in the foreseeable future. Concerning the outlook for the 26th fiscal year starting on September 1st, the prospects concerning the supply of raw materials are not as favorable as in the previous year, due to a price increase for both barley as well as hops. However, the sales in the running year appear to be improving, as far as the observations from the first months allow for conclusions. It needs to be considered, however, that the weather in the months of September and October of the current year has been fortunate for the beer consumption and that, having said that, disturbances as in the previous years are not to be expected."

- Shareholder Meeting: November 14th 1895
- Publication of the Balance Sheet and Income Statement: November 15th 1895

Schultheiss' Brauerei Actien-Gesellschaft.

Debet. Gewinn- und Verlust-Conto am 31. August 1895. Credit.

	ℳ	Pf	ℳ	Pf		ℳ	Pf	ℳ	Pf
An Fabrikationskosten: Brausteuer, Löhne, Brennmaterial etc.	1 473 707	97			Per Saldo-Vortrag			9 757	20
An Unkosten: Gehälter, Handlungsunkosten, Fuhrwerksunkosten, Reparaturen, bauliche Veränderungen, Unkosten der Ausschanklocale, Steuern und Abgaben	1 521 361	27			Per Brutto-Gewinn: an Bier in Fässern	4 348 957	52		
An Flaschenbiergeschäft: Löhne, Flaschenverbrauch und sonstige Unkosten	418 448	12			an Bier in Flaschen	727 627	15		
An Zinsen: Hypotheken-, Prioritäten- und Darlehnszinsen ℳ 212 383. 79					an Brauerei- und Mälzerei-Abgängen	324 128	61	5 400 713	28
10 % Zuschuss-Zinsen auf Spareinlage „ 16 363. 10	228 746	89	3 642 264	25					
An Verlust auf Effecten			303	80					
An Verlust auf Darlehen			12 811	85					
An Reserve für zweifelhafte Debitoren			50 000	—	Per Miethserträge d. Grundstücke			3 002	66
An Abschreibungen:									
Gebäude 2 % de ℳ 7 301 274. 48	146 025	48							
Brunnenbau 10 % „ „ 32 199. 81	2 219	98							
Wegebau 10 % „ „ 123 513. 10	12 351	31							
Canalisation 10 % „ „ 28 662. 72	2 866	27							
Lagerfässer und Bottiche 10 % „ „ 255 970. 25	25 597	03							
Maschinen und Utensilien 20 % „ „ 747 186. 42	149 437	28							
Inventar 20 % „ „ 300 239. 48	60 047	90							
Inventar der Ausschanklocale 25 % „ „ 241 502. 99	60 375	75							
Auswärtige Niederlagen 25 % „ „ 75 875. 42	18 968	85							
Eisenbahnwagen 25 % „ „ 27 793. 40	6 948	35							
Pferde und Wagen 33⅓ % „ „ 332 970. 55	110 993	18							
Absatztonnen 50 % „ „ 115 473. 63	57 737	31	653 369	19					
An Saldo Netto-Gewinn			1 059 724	05					
welcher sich vertheilt, wie folgt:									
Zu Unterstützungen und Remunerationen	50 000	—							
Tantièmen des Aufsichtsraths und der Direction	157 495	02							
14 % Dividende de Mark 6 000 000 —	840 000	—							
Saldo-Uebertrag aufs nächste Jahr	12 229	03							
	1 059 724	05							
			5 418 473	14				5 413 473	14

Debet. Netto-Bilanz ultimo August 1895. Credit.

	ℳ	Pf	ℳ	Pf		ℳ	Pf	ℳ	Pf
Grundstücke in Berlin	1 609 216	68			Actien-Conto			6 000 000	—
„ „ Fürstenwalde a. d. Spree	182 966	32			Prioritäts-Obligationen-Conto			2 357 600	—
„ „ Pankow	75 600	—			Hypotheken	2 454 600	—		
„ „ Hamburg	178 200	—			ab: Amortisation	94 450	20	2 360 149	80
„ „ Brandenburg a. H.	35 477	90			Nicht abgehobene Prioritäten-Zinsen			6 124	50
„ „ Lübben	3 514	01			Nicht abgehobene Dividende			3 425	—
„ „ Frankfurt a. O.	9 123	80			Prioritäts- u. Hypotheken-Zinsen per Juli-August			34 462	62
„ „ Lankwitz-Lichterfelde	60 000	—	2 154 098	71	Unterstützungs-Fonds			13 344	58
Gebäude und Kellereien in Berlin	5 411 112	89			Sparkassen-Conto			240 129	12
„ „ „ „ Fürstenwalde a. Spree	900 939	31			Depôts und Creditoren			143 159	—
„ „ „ „ Pankow	591 391	73			Cautions-Conto			30 338	—
„ „ „ „ Hamburg	128 274	02			Reserve für zweifelhafte Debitoren			72 785	60
„ „ „ „ Brandenburg a. H.	87 640	65			Extra-Reserve			50 000	—
„ „ „ „ Lübben	17 932	29			Reserve-Fonds			2 140 180	—
„ „ „ „ Frankfurt a. O.	17 958	11	7 155 249	—	Gewinn			1 059 724	05
Brunnenbau-Conto			19 979	83					
Wegebau-Conto			111 161	79					
Canalisations-Conto			25 796	45					
Lagerfässer und Bottiche			228 573	22					
Maschinen und Utensilien			597 749	14					
Inventar-Conto			240 191	58					
Inventar- und Einrichtungs-Conto der Ausschanklocale			121 127	24					
Eisenbahnwagen-Conto			20 849	05					
Pferde- und Wagen-Conto			221 986	37					
Absatztonnen-Conto			57 737	89					
Auswärtige Niederlagen, Inventar- und Einrichtungs-Conto			56 906	57					
Auswärtiges Niederlagen, Waaren-Conto			54 153	46					
Cassa-Conto			55 053	85					
Wechsel-Conto			9 536	94					
Effecten-Conto			176 587	50					
Bankguthaben, eigene Hypotheken und Debitoren			1 420 502	14					
Vorausbezahlte Miethen und Steuern			25 509	76					
Futter-Vorräthe			2 146	40					
Nutzholz-Vorräthe			2 056	—					
Vorräthe an Mälzerei-Abgängen			2 801	40					
Ausstehende Forderungen	264 114	12							
ab für Ausfälle	31 198	22	252 915	90					
Waarenbestände			1 438 756	15					
			14 511 422	27				14 511 422	27

Schultheiss' Brauerei Actien-Gesellschaft.

Income Statement as of August 31, 1895.

Debit.						**Credit.**
Production costs:						
Brewing tax, wages, fuels etc.		1 473 707.97		Profit carried forward		9 757.20
Expenses:				Gross profits:		
Salaries, general expenses, transportation expenses, repairs, constructional changes, expenses of the taverns, taxes and concessions		1 521 361.27		Beer in kegs	4 348 957.52	
Bottled beer business:				Bottled beer	727 627.15	
Wages, cost of bottles and other expenses		418 448.12		Outflows of brewery and malting	324 128.61	5 400 713.28
Interest:				Rent income		8 002.86
Interest payments on mortgages, priorities, and loans	212 383.79					
10 % extra interest on savings deposit	16 363.10	228 746.89	3 642 264.25			
Loss on securities			303.80			
Loss on loans			12 811.85			
Reserve for dubious debts			50 000.00			
Depreciation						
Buildings	2% of 7 301 274.48	146 025.48				
Well construction	10% of 32 199.81	2 219.98				
Road-building	10% of 123 513.10	12 351.31				
Canalization	10% of 28 662.72	2 866.27				
Kegs and barrels	10% of 233 970.25	25 397.03				
Machines and utensils	20% of 747 186.42	149 437.28				
Inventory	20% of 300 239.48	60 047.90				
Inventories of the taverns	25% of 241 502.99	60 375.75				
External establishments	25% of 75 875.42	18 968.85				
Railway carriages	25% of 27 793.40	6 948.35				
Horses and wagons	33 1/3% of 332 979.55	110 993.18				
Sales tons	50% of 115 475.63	57 737.81	653 369.19			
Earnings			1 059 724.05			
which are used as follows:						
for support and remuneration		50 000.00				
Bonuses for the board and the management		157 495.02				
14 % dividends on Mark 6 000 000 -		840 000.00				
Profit carried forward to the next year		12 229.03				
		1 059 724.05				
			5 418 473.14			5 418 473.34

Balance sheet as of August 1895.

Debit.			Credit.		
Properties in Berlin	1 609 216.68		Company stocks		6 000 000.00
" " Fürstenwalde a. d. Spree	182 966.32		Priority obligations account		2 357 600.00
" " Pankow	75 600.00		Mortgages	2 454 600.00	
" " Hamburg	178 200.00		minus: amortization	94 450.20	2 360 149.80
" " Brandenburg a. H.	35 477.90		Unpaid priority interest		6 124.50
" " Lübben	3 514.01		Unpaid dividends		3 425.00
" " Frankfurt a. O.	9 123.80		Priority and mortgage interests as of July-August		34 462.62
" " Lankwitz-Lichterfelde	60 000.00	2 154 098.71	Support fund		13 344.58
Buildings and cellars in Berlin	5 411 112.89		Savings bank account		240 129.12
" " " " Fürstenwalde a. Spree	900 939.31		Depots and creditors		143 159.00
" " " " Pankow	591 391.73		Deposits account		30 338.00
" " " " Hamburg	128 274.02		Reserve for dubious debts		72 785.60
" " " " Brandenburg a. H.	87 640.65		Extra reserve		50 000.00
" " " " Lübben	17 932.29		General reserve fund		2 140 180.00
" " " " Frankfurt a. O.	17 958.11	7 155 249.00	Earnings		1 059 724.05
Well construction account		19 979.83			
Road-building account		111 161.79			
Canalization account		25 796.45			
Kegs and barrels		228 573.22			
Machines and utensils		597 749.14			
Inventory account		240 191.58			
Inventory and equipment account of the taverns		181 127.24			
Railway carriages account		20 845.05			
Horses and wagons account		221 986.37			
Sales tons account		57 737.82			
External establishments, Inventory and equipment account		56 906.57			
External establishments, Wares account		54 153.46			
Cash		55 053.85			
Acceptances		9 536.94			
Securities		176 587.50			
Cash at bank, own mortgages and loans		1 420 502.14			
Prepaid rents and taxes		25 509.76			
Feed stock		2 146.40			
Wood stock		2 056.00			
Stock on malting outflows		2 801.40			
Accounts receivable	284 114.12				
minus defaults	31 198.22	252 915.90			
Wares in stock		1 438 756.15			
		14 511 422.27			14 511 422.27

Construction of Voluntary Disclosure Proxy

Asset Positions	38
Capital Positions	+ 15
Positions on Expenses	+ 25
Positions on Revenues	+ 5
Positions on Income Distribution (remuneration + bonus + dividends + profit carried forward)	- 4
= Positions in Total	**= 79**

Figure 1: Timeline

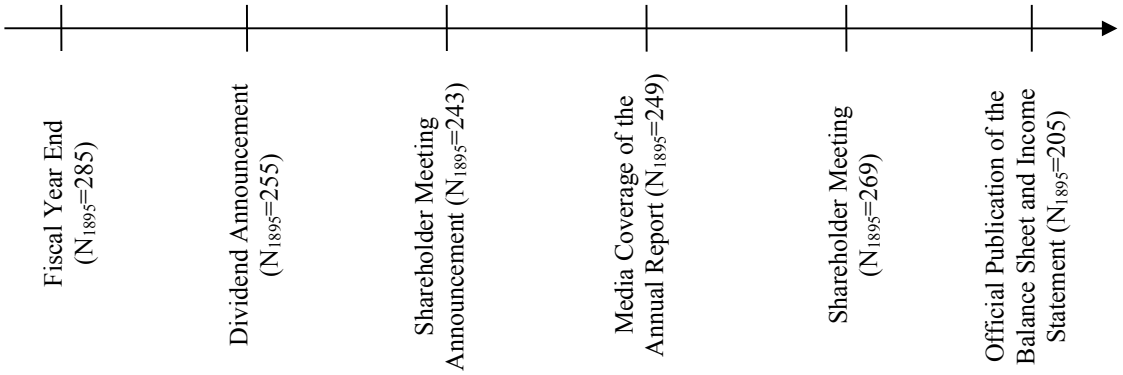


Table 1: Descriptive Statistics of the Timeline in 1895

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
FYE_Publication	205	105.4829	39.3511	33.0000	77.0000	98.0000	126.0000	303.0000
FYE_Meeting	269	106.6468	38.2010	33.0000	78.0000	104.0000	128.0000	302.0000
FYE_Dividend	255	71.1608	34.4434	9.0000	46.0000	69.0000	89.0000	269.0000
Dividend_Announce	219	6.5708	17.8461	-45.0000	0.0000	2.0000	9.0000	94.0000
Announce_Meeting	243	26.6625	7.5909	8.0000	22.0000	25.0000	30.0000	77.0000
Announce_BBZ	218	13.3532	9.3089	-7.0000	7.0000	12.0000	19.0000	67.0000
BBZ_Meeting	238	12.5756	7.5019	-15.0000	7.0000	14.0000	17.0000	34.0000
BBZ_Lines	249	88.5502	58.3209	16.0000	52.0000	76.0000	111.0000	420.0000
Meeting_Publication	202	2.2624	1.5758	0.0000	1.0000	2.0000	3.0000	10.0000

This table shows descriptive statistics of the dividend announcement, the official announcement of the annual shareholder meeting in the *'Berliner Börsen-Zeitung'* (*BBZ*), the coverage of the annual reports by the *BBZ*, the annual shareholder meeting and the official publication of the balance sheet and the income statement of publicly listed firms in Imperial Germany for the year 1895. *FYE_Publication* is the time span between the fiscal year end and the official publication of the balance sheet and the income statement by a firm in the *BBZ* in days. *FYE_Meeting* is the time span between the fiscal year end and the annual shareholder meeting in days. *FYE_Dividend* is the time span between the fiscal year end and the dividend announcement in days. *Dividend_Announce* is the time span between the dividend announcement and the announcement of the annual shareholder meeting in the *BBZ* in days. *Announce_Meeting* is the time span between the announcement of the annual shareholder meeting in the *BBZ* and the annual shareholder meeting in days. *Announce_BBZ* is the time span between the announcement of the annual shareholder meeting in the *BBZ* and the coverage of the annual report by the *BBZ* in days. *BBZ_Meeting* is the time span between the coverage of the annual report by the *BBZ* and the annual shareholder meeting in days. *BBZ_Lines* is the extent of the coverage of the annual report by the *BBZ* in lines. *Meeting_Publication* is the time span between the annual shareholder meeting and the official publication of the balance sheet and income statement by a firm in the *BBZ*.

Table 2: Content Analysis of the Media Coverage of the Annual Reports (N=60)

Panel A: Content Analysis of the Media Coverage of the Annual Reports

Information	Positive	Neutral	Negative	No Information
Industry-specific	11	9	30	10
Firm-specific	28	19	9	4
Economy-wide	0	1	4	55

Panel B: Level of Disaggregation in Annual Reports and Published Financial Statements

	No Deviation	Higher Disaggregation in Annual Report
Assets	60	0
Capital	60	0
Expenses	56	4
Revenues	59	1
Income distribution	49	11

This table shows the results of a content analysis of the media coverage of the annual reports by the *'Berliner Börsen-Zeitung'* in 1895. The information was evaluated by the author and a research assistant. Deviations in the assessments of the information were discussed.

Table 3: Sample Selection

Firms listed on Berlin Stock Exchange on December 31st 1895	629
- Banks	- 108
- Insurance companies	- 47
- Railway companies	- 74
- IPOs after January 1, 1890	- 68
- Missing data or very poor data quality	- 24
- Data in foreign currency only	- 5
- Not assigned to an industry by *'Saling's Börsenpapiere'*	- 18
= Final Sample	**= 285**

Table 4: Industry Classification According to *'Saling's Börsenpapiere' Vol. 19 (1895/96)*

	Industry	# Firms
1	mining and steel producer	75
2	construction	22
3	construction materials	14
4	electricity and water supply works	7
5	breweries	37
6	chemical factories	14
7	engineering and railroad supply	30
8	glass and porcelain	5
9	rubber	6
10	metal	16
11	mills	6
12	paper and carton	5
13	transportation	5
14	water transportation	15
15	clothes and hats	5
16	weaving and spinning	18
17	sugar factories	5
		285

Table 5: Descriptive Statistics of the Voluntary Disclosure Proxy

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
full sample								
pos_assets	570	16.5175	7.4720	5.0000	12.0000	15.0000	19.0000	78.0000
pos_capital	570	11.3404	3.5759	2.0000	9.0000	11.0000	13.0000	26.0000
pos_expenses	570	7.5842	4.9230	0.0000	4.0000	7.0000	9.0000	37.0000
pos_revenues	570	4.1894	2.2276	1.0000	3.0000	4.0000	5.0000	22.0000
pos_inc_distribution	570	4.0070	1.8692	0.0000	3.0000	4.0000	5.0000	9.0000
pos_sum	570	35.6333	12.3906	16.0000	28.0000	33.0000	42.0000	125.0000
industry leader								
pos_assets	160	18.2875	10.1153	6.0000	12.0000	16.0000	21.0000	78.0000
pos_capital	160	13.0188	3.7508	5.0000	10.0000	12.0000	15.0000	26.0000
pos_expenses	160	8.8813	6.2034	1.0000	4.0000	7.0000	11.0000	37.0000
pos_revenues	160	4.5688	2.5169	1.0000	3.0000	4.0000	6.0000	15.0000
pos_inc_distribution	160	4.5125	1.7734	0.0000	4.0000	5.0000	6.0000	9.0000
pos_sum	160	40.2438	16.3352	18.0000	29.0000	37.0000	47.0000	125.0000
industry follower								
pos_assets	410	15.8268***	6.0160	5.0000	12.0000	15.0000**	19.0000	45.0000
pos_capital	410	10.6854***	3.2846	2.0000	9.0000	10.0000***	13.0000	24.0000
pos_expenses	410	7.0780***	4.2240	0.0000	4.0000	6.0000***	9.0000	25.0000
pos_revenues	410	4.0415***	2.0887	1.0000	3.0000	4.0000*	5.0000	22.0000
pos_inc_distribution	410	3.8098***	1.8706	0.0000	3.0000	4.0000***	5.0000	8.0000
pos_sum	410	33.8220***	9.9158	16.0000	27.0000	32.0000	39.0000	72.0000

This table shows descriptive statistics of the numbers of positions reported within the sample firms' balance sheets and income statements for the fiscal years 1890 and 1894. *pos_assets* is the number of positions related to assets in the balance sheet. *pos_capital* is the number of positions related to equity or liabilities in the balance sheet. *pos_expenses* is the number of positions related to expenses in the income statement. *pos_revenues* is the number of positions related to revenues in the income statement. *pos_inc_distribution* is the number of positions related to the distribution of the net income in the balance sheet and income statement. *pos_sum* is the number of positions reported in the balance sheet and the income statement adjusted for positions related to the distribution of the net income. A firm is categorized as an industry leader if the firm's market share ranks in the upper quartile. ***/**/* marks significance at the 1/5/10% level based on a one tailed t-test of the difference of the means of industry leaders and industry followers, respectively the Wilcoxon rank test of the median. All values are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892*) and *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*.

Table 6: Descriptive Statistics of the Competition Variables

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
ind_ppe	34	8,426,889	11,290,721	1,734,649	2,444,267	3,927,365	7,241,540	50,239,508
market_size	34	18,137,613	26,726,193	1,502,155	4,519,665	9,776,171	22,020,572	136,955,168
4_firm_conc	34	0.7125	0.2480	0.2134	0.4864	0.7632	0.9482	0.9948
HHI	34	0.2168	0.1389	0.0294	0.0916	0.1763	0.3071	0.5282
ind_pc_mgn	34	2.3407	1.1215	1.2128	1.6301	2.0886	2.6330	6.7492
ind_roa	34	0.0574	0.0222	0.0031	0.0408	0.0601	0.0724	0.0936

This table shows descriptive statistics of competition proxies used in a principal component analysis (see table 7). *ind_ppe* is the weighted average of property, plant, and equipment in an industry. A firm's market share (revenues over industry aggregate revenues) is used as its weight. *market_size* is the industry-level sum of revenues. *4_firm_conc* is the four firm concentration ratio which is defined as the sum of revenues of the four largest firms within an industry over *market_size*. *HHI* is the Herfindahl-Hirschman Index, which is defined as the sum of the squared market shares of all firms within an industry. *ind_pc_mgn* is the industry-level price-cost margin, measured as industry aggregate revenues over industry aggregate operating expenses. Firm-level operating expenses are total expenses minus extraordinary expenses. Extraordinary expenses are expenses that are extraordinary with respect to their occurrence and/or amount and are manually identified. *ind_roa* is the industry-level mean of the return on assets (net income over total assets). All values on the firm-level are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*.

Table 7: Principal Component Analysis

Panel A: Eigenvalues of the Correlation Matrix

Principal Component	Eigenvalue	Difference in Eigenvalue	Variance Explained	Cumulative
PC 1	**2.4521**	**0.9125**	**0.4087**	**0.4087**
PC 2	**1.5397**	**0.3388**	**0.2566**	**0.6653**
PC 3	**1.2001**	**0.5955**	**0.2001**	**0.8654**
PC 4	0.6053	0.4716	0.1009	0.9663
PC 5	0.1337	0.0653	0.0223	0.9986
PC 6	0.0684	-	0.0114	1.0000

Panel B: Rotated Components

Variable	PC 1	PC 2	PC 3	Unexplained
ind_ppe	0.0610	-0.0076	**0.8497**	0.0348
ln_market_size	**-0.4821**	**0.2108**	**0.3463**	0.2037
4_firm_conc	**0.6300**	0.0386	0.1449	0.0340
HHI	**0.5996**	0.0828	0.0910	0.1232
ind_pc_mgn	-0.0314	**0.7352**	0.1670	0.2310
ind_roa	0.0803	**0.6377**	**-0.3175**	0.1747

Panel C: Descriptive Statistics of the Principal Components

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
existing	34	0.0000	1.5532	-2.3750	-1.4030	-0.1018	1.0749	3.2179
profit	34	0.0000	1.1979	-2.2258	-0.6981	-0.1334	0.2655	3.1741
potential	34	0.0000	1.1598	-3.8318	0.0878	0.3829	0.6240	1.0542

This table shows the results of a principal component analysis. *ind_ppe* is the weighted average of property, plant, and equipment in an industry. A firm's market share (revenues over industry aggregate revenues) is used as its weight. *ln_market_size* is the natural logarithm of the industry-level sum of revenues. *4_firm_conc* is the four firm concentration ratio which is defined as the sum of revenues of the four largest firms within an industry over *market_size*. *HHI* is the Herfindahl-Hirschman Index which is defined as the sum of the squared market shares of all firms within an industry. *ind_pc_mgn* is the industry-level price-cost margin measured as industry aggregate revenues over industry aggregate operating expenses. Firm-level operating expenses are total expenses minus extraordinary expenses. Extraordinary expenses are expenses that are extraordinary with respect to their occurrence and/or amount and are manually identified. *ind_roa* is the industry-level mean of the return on assets (net income over total assets). *existing* is the negative of PC 1 and reflects existing competition. *profit* is PC 2 and reflects industry profitability. *potential* is the negative of PC 3 and reflects potential competition. All values on the firm-level are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*.

Table 8: Correlation Matrix for Competition Proxies

N=34	*existing*	*profit*	*potential*	*ind_ppe*	*ln_market_size*	*4_firm_conc*	*HHI*	*ind_pc_mgn*	*ind_roa*
existing	X	-0.2131	**-0.3225**	0.1358	**0.7338**	**-0.9432**	**-0.9542**	-0.0665	-0.2504
profit	-0.0502	X	0.2752	-0.0231	0.0160	0.0958	0.1988	**0.7238**	**0.8930**
potential	-0.0924	0.1287	X	**-0.8756**	**-0.5661**	0.1587	0.2049	0.0448	**0.5227**
ind_ppe	-0.0032	-0.1312	**-0.9779**	X	**0.4347**	-0.0246	-0.0218	0.1147	-0.2712
ln_market_size	**0.7732**	0.1632	**-0.4384**	**0.3398**	X	**-0.6345**	**-0.5694**	-0.1343	-0.0234
4_firm_conc	**-0.9653**	0.0738	-0.0717	0.1503	**-0.6650**	X	**0.9257**	-0.0396	0.1212
HHI	**-0.9266**	0.1323	-0.0067	0.0793	**-0.5289**	**0.8826**	X	-0.0179	**0.2477**
ind_pc_mgn	0.0224	**0.8533**	-0.0849	0.0402	0.0864	0.0362	-0.0352	X	**0.4490**
ind_roa	-0.1970	**0.8176**	**0.4781**	**-0.4126**	-0.0105	0.1434	0.2817	**0.4244**	X

This table shows correlation coefficients for the competition proxies. Pearson correlation coefficients are presented below the diagonal. Spearman correlation coefficients are presented above the diagonal. Bold entries indicate significance at the 10% level or lower. *existing* is the negative of PC 1 (see table 7, Panel B) and reflects existing competition. *profit* is PC 2 (see table 7, Panel B) and reflects industry profitability. *potential* is the negative of PC 3 (see table 7, Panel B) and reflects potential competition. *ind_ppe* is the weighted average of property, plant, and equipment in an industry. A firm's market share (revenues over industry aggregate revenues) is used as its weight. *ln_market_size* is the natural logarithm of the industry-level sum of revenues. *4_firm_conc* is the four firm concentration ratio, which is defined as the sum of revenues of the four largest firms within an industry over *market_size*. *HHI* is the Herfindahl-Hirschman Index, which is defined as the sum of the squared market shares of all firms within an industry. *ind_pc_mgn* is the industry-level price-cost margin measured as industry aggregate revenues over industry aggregate operating expenses. Firm-level operating expenses are total expenses minus extraordinary expenses. Extraordinary expenses are expenses that are extraordinary with respect to their occurrence and/or amount and are manually identified. *ind_roa* is the industry-level mean of the return on assets (net income over total assets). All values on the firm-level are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896).*

Table 9: Competition and Voluntary Disclosure by Industry and Year
Panel A: Competition and Voluntary Disclosure in 1890

	existing	*profit*	*potential*	*ind_sum*
low	rubber	construction	transportation	clothes and hats *(26.8 positions)*
	glass and porcelain	water transportation	water transportation	sugar factories *(26.8 positions)*
	clothes and hats	sugar factories	mining and steel producer	rubber *(27.6 positions)*
	sugar factories	weaving and spinning	electricity and water supply works	glass and porcelain *(28.8 positions)*
	paper and carton	breweries	chemical factories	chemical factories *(29.6 positions)*
	transportation	mills	construction	engineering and railroad supply *(30.1 positions)*
medium	electricity and water supply works	construction materials	sugar factories	weaving and spinning *(30.2 positions)*
	mills	clothes and hats	weaving and spinning	mills *(30.7 positions)*
	water transportation	transportation	breweries	construction *(31.5 positions)*
	construction materials	paper and carton	metal	construction materials *(32.6 positions)*
	chemical factories	metal	glass and porcelain	metal *(33.7 positions)*
high	metal	engineering and railroad supply	paper and carton	paper and carton *(34.4 positions)*
	construction	rubber	construction materials	water transportation *(36.9 positions)*
	weaving and spinning	glass and porcelain	rubber	mining and steel producer *(38.4 positions)*
	engineering and railroad supply	chemical factories	engineering and railroad supply	breweries *(38.9 positions)*
	breweries	mining and steel producer	mills	electricity and water supply works *(43 positions)*
	mining and steel producer	electricity and water supply works	clothes and hats	transportation *(47.6 positions)*

Panel B: Competition and Voluntary Disclosure in 1894

	existing	*profit*	*potential*	*ind_sum*
low	rubber *(0)*	transportation *(-8)*	transportation (0)	clothes and hats *(25.6 positions; -1.2 positions; 0)*
	sugar factories *(-2)*	weaving and spinning (-2)	mining and steel producer (-1)	rubber *(26 positions; -1.6 positions; -1)*
	clothes and hats *(0)*	construction (+2)	water transportation (+1)	sugar factories *(27.4 positions; +0.6 positions; +1)*
	glass and porcelain (+2)	mills (-2)	electricity and water supply works (0)	chemical factories *(29.6 positions, +/- 0 positions; -1)*
	paper and carton (0)	water transportation (+3)	metal (-5)	glass and porcelain *(29.8 positions; +1 position; +1)*
	transportation (0)	breweries (+1)	construction (0)	weaving and spinning *(31.1 positions; +0.9 positions; -1)*
medium	electricity and water supply works (0)	paper and carton (-3)	chemical factories (+2)	engineering and railroad supply *(32.1 positions, +2 positions; +1)*
	mills (0)	metal (-3)	weaving and spinning (0)	constructions materials *(32.1 positions, -0.5 positions; -2)*
	water transportation (0)	construction materials (+2)	paper and carton (-3)	paper and carton *(32.6 positions; -1.8 positions; -3)*
	metal (-2)	mining and steel producer (-6)	breweries (+1)	construction *(33.5 positions; +2 positions; +1)*
	chemical factories (0)	engineering and railroad supply (-1)	glass and porcelain (0)	mills *(33.7 positions; +3 positions; +3)*
high	construction materials (+2)	sugar factories (+9)	mills (-4)	metal *(35 positions, +1.3 positions; +1)*
	weaving and spinning (-1)	glass and porcelain (-1)	engineering and railroad supply (-2)	water transportation *(38.9 positions; +2 positions, 0)*
	construction (+1)	clothes and hats (+6)	construction materials (+1)	breweries *(40.6 positions; +1.7 positions; -1)*
	engineering and railroad supply (0)	rubber (+2)	sugar factories (+8)	mining and steel producer *(41.4 positions, +3 positions; +1)*
	breweries (0)	electricity and water supply works (-1)	rubber (+2)	electricity and water supply works *(48.6 positions; +5.6 positions; 0)*
	mining and steel producer (0)	chemical factories (+2)	clothes and hats (0)	transportation *(49.6 positions; +2 positions; 0)*

Panel C: Average Competition and Average Voluntary Disclosure

Industry	*existing*	*profit*	*potential*	*ind_sum*
clothes and hats	low	medium	high	26.2
rubber	low	high	high	26.8
sugar factories	low	medium	high	27.1
glass and porcelain	low	high	medium	29.3
chemical factories	medium	high	low	29.6
weaving and spinning	high	low	medium	30.7
engineering and railroad supply	high	high	high	31.1
mills	medium	low	high	32.2
construction materials	medium	medium	high	32.4
construction	high	low	low	32.5
paper and carton	low	medium	medium	33.5
metal	high	medium	medium	34.3
water transportation	medium	low	low	37.8
breweries	high	low	medium	39.7
mining and steel producer	high	high	low	40.0
electricity and water supply works	medium	high	low	45.8
transportation	low	low	low	48.6

This table shows the characteristics of competition and voluntary disclosure for each industry and year as well as average competition and average voluntary disclosure for each industry. *existing* is the negative of PC 1 (see table 7, Panel B) and reflects existing competition. *profit* is PC 2 (see table 7, Panel B) and reflects industry profitability. *potential* is the negative of PC 3 (see table 7, Panel B) and reflects potential competition. *ind_sum* is the industry level mean of *pos_sum*. *pos_sum* is the number of positions reported in the balance sheet and the income statement adjusted for positions related to the distribution of the net income (see table 5).

Table 10: Descriptive Statistics of Firm-level Control Variables

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
full sample								
cap_inc	570	0.2561	0.4369	0.0000	0.0000	0.0000	1.0000	1.0000
asset_utilization	570	0.1812	0.1903	0.0001	0.0830	0.1366	0.2182	2.6315
var_comp	512	0.1042	0.0853	0.0000	0.0601	0.0984	0.1368	1.0000
tot_assets	570	7,375,330	11,045,881	411,156	2,136,571	3,770,302	7,492,127	96,770,224
roa	570	0.0563	0.0494	-0.1460	0.0251	0.0510	0.0833	0.3088
eq_quota	570	0.7094	0.1511	0.2100	0.6173	0.7228	0.8189	0.9965
industry leader								
cap_inc	160	0.3688	0.4840	0.0000	0.0000	0.0000	1.0000	1.0000
asset_utilization	160	0.2706	0.2998	0.0314	0.1071	0.1925	0.3282	2.6315
var_comp	152	0.0939	0.0615	0.0000	0.0486	0.0904	0.1360	0.4035
tot_assets	160	15,678,516	16,923,831	1,457,801	5,208,683	10,042,505	21,139,400	96,770,224
roa	160	0.0738	0.0529	-0.0468	0.0389	0.0681	0.0994	0.3088
eq_quota	160	0.6529	0.1376	0.3050	0.5670	0.6680	0.7430	0.9061
industry follower								
cap_inc	410	0.2122***	0.4094	0.0000	0.0000	0.0000***	0.0000	1.0000
asset_utilization	410	0.1462***	0.1053	0.0001	0.0776	0.1240***	0.1872	0.6559
var_comp	360	0.1085**	0.0932	0.0000	0.0660	0.0998*	0.1377	1.0000
tot_assets	410	4,135,062***	4,538,115	411,156	1,786,805	3,048,338***	4,649,381	60,404,080
roa	410	0.0494***	0.0462	-0.1460	0.0210	0.0437***	0.0739	0.2434
eq_quota	410	0.7315***	0.1510	0.2100	0.6342	0.7477***	0.8379	0.9965

This table shows descriptive statistics of the firm-level controls variables. *cap_inc* is a dummy variable that equals one if the firm raised public equity or debt between January 1, 1890 and December 31, 1895, and zero otherwise. *asset_utilization* is the asset utilization ratio and defined as revenues over total assets. *var_comp* is the variable compensation of the management scaled by net income. *tot_assets* is a firms' total assets. *roa* is a firm's net income over total assets. *eq_quota* is equity (capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves) scaled by total assets. A firm is categorized as an industry leader, if the firm's market share ranks in the upper quartile. ***/**/* marks significance at the 1/5/10% level based on a one tailed t-test of the difference of the means of industry leaders and industry followers, respectively the chi² test of the mean of the dichotomous variable, or the Wilcoxon rank test of the median. All values are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*.

Table 11: Correlation Matrix for the Voluntary Disclosure Proxy, the Competition Proxies and the Firm-level Control Variables

N = 570	*pos_sum*	*existing*	*profit*	*potential*	*cap_inc*	*asset_utilization*	*var_comp* **(N=512)**	*ln_tot_assets*	*roa*	*eq_quota*
pos_sum	X	**0.2158**	**-0.0854**	**-0.2502**	**0.1516**	**0.0964**	-0.0662	**0.3315**	**-0.1545**	**-0.1450**
existing	**0.2130**	X	**0.2230**	**-0.3900**	**0.1181**	-0.0253	**-0.1619**	**0.2614**	**0.0363**	0.0124
profit	-0.0049	**0.1909**	X	**0.1230**	**0.0854**	**0.1295**	0.0145	**0.1082**	**0.3748**	**0.1369**
potential	**-0.3153**	**-0.3370**	**-0.1206**	X	**-0.1409**	**0.1364**	**0.2463**	**-0.3167**	**0.2109**	-0.0465
cap_inc	**0.2171**	**0.1308**	**0.0974**	**-0.1493**	X	0.0235	0.0028	**0.2247**	0.0565	**-0.2625**
asset_utilization	0.0469	**-0.0772**	0.0190	**0.0892**	-0.0156	X	**0.2343**	**-0.2010**	**0.4996**	-0.0395
var_comp **(N=512)**	**-0.1100**	**-0.0820**	-0.0294	**0.1266**	0.0311	0.0582	X	**-0.2429**	**0.1392**	**-0.0911**
ln_tot_assets	**0.4400**	**0.2236**	**0.1493**	**-0.3665**	**0.2628**	**-0.1295**	**-0.1560**	X	0.0216	**-0.2106**
roa	**-0.1228**	-0.0151	**0.3677**	**0.1359**	0.0359	**0.3106**	0.0369	-0.0562	X	**0.1285**
eq_quota	**-0.1374**	0.0151	**0.1419**	**-0.0776**	**-0.2465**	-0.0192	0.0029	**-0.2257**	0.0554	X

This table shows correlation coefficients for the voluntary disclosure proxy, the competition proxies and the firm-level control variables. Pearson correlation coefficients are presented below the diagonal. Spearman correlation coefficients are presented above the diagonal. Bold entries indicate significance at the 10% level or lower. *pos_sum* is the number of positions reported in a firm's balance sheet and income statements adjusted for positions related to the distribution of the net income. *existing* is the negative of PC 1 (see table 7, Panel B) and reflects existing competition. *profit* is PC 2 (see table 7, Panel B) and reflects industry profitability. *potential* is the negative of PC 3 (see table 7, Panel B) and reflects potential competition. *cap_inc* is a dummy variable that equals one if the firm raised public equity or debt between January 1, 1890 and December 31, 1895, and zero otherwise. *asset_utilization* is the asset utilization ratio and defined as revenues over total assets. *var_comp* is the variable compensation of the management scaled by net income. *ln_tot_assets* is the natural logarithm of a firms' total assets. *roa* is a firms' net income over total assets. *eq_quota* is equity (capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves) scaled by total assets. All values are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896).*

Table 12: Panel Analyses

	All Firms				*Industry Leader*		*Industry Follower*		*Industry-Level*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	*pos_sum*	*pos_sum*	*pos_sum*	*pos_sum*	*pos_sum*	*pos_sum*	*pos_sum*	*pos_sum*	*ind_sum*
constant	**33.6109***** **(0.8470)**	-35.9164 (15.1170)	**-32.7504**** **(15.6896)**	**-28.9211*** **(15.7095)**	**37.6710***** **(1.7202)**	-38.2986 (37.2860)	**31.7826***** **(0.6650)**	**-35.5776***** **(10.9366)**	**34.6876***** **(0.9631)**
existing	**1.1517**** **(0.4932)**	0.7661 (0.5339)	0.7642 (0.5039)	0.7988 (0.5166)	**1.4805*** **(0.7984)**	1.0532 (0.7870)	**1.3947***** **(0.4534)**	**0.9352***** **(0.3479)**	**0.4016***** **(0.0910)**
profit	**-0.6984***** **(0.1512)**	**-0.4417***** **(0.1088)**	**-0.3959***** **(0.1394)**	-0.1481 (0.1494)	**-1.5472**** **(0.6082)**	**-1.4654***** **(0.5510)**	**-0.5630***** **(0.1564)**	**-0.2877*** **(0.1502)**	-0.6017 (0.4484)
potential	**-3.3625***** **(0.6890)**	**-1.5703**** **(0.6791)**	**-1.6429**** **(0.6527)**	**-1.3239*** **(0.6836)**	**-5.5777***** **(1.1905)**	**-2.6696*** **(1.5050)**	**-2.1602***** **(0.7096)**	-0.6451 (0.5338)	**-3.3075***** **(0.3062)**
leader	-	-	-	0.6113 (1.5399)	-	-	-	-	-
*existing * leader*	-	-	-	0.0061 (0.6378)	-	-	-	-	-
*profit * leader*	-	-	-	**-0.9447**** **(0.4465)**	-	-	-	-	-
*potential * leader*	-	-	-	**-1.3303*** **(0.7771)**	-	-	-	-	-
cap_inc	-	2.2095 (1.4076)	**2.4470*** **(1.4267)**	2.3584 (1.4746)	-	**4.4833*** **(2.4494)**	-	0.8512 (1.5493)	**11.5884***** **(3.4809)**
asset_ utilization	-	**5.3194**** **(2.2419)**	**4.9267***** **(1.8162)**	**4.6220***** **(1.7593)**	-	**5.2098**** **(2.1691)**	-	**19.4335***** **(5.2928)**	**10.1945***** **(2.9033)**
var_comp	-	-1.0603 (2.4076)	-	-	-	-	-	-	**-46.2195***** **(9.4494)**
ln_tot_assets	-	**4.8481***** **(1.0215)**	**4.6480***** **(1.0067)**	**4.3896***** **(1.0196)**	-	**4.8644**** **(2.4511)**	-	**4.7442***** **(0.7416)**	-
roa	-	**-31.0697***** **(7.5103)**	**-33.0890***** **(5.3195)**	**-31.9580***** **(5.7470)**	-	**-30.2511**** **(12.0160)**	-	**-44.3898***** **(8.4997)**	-
eq_quota	-	-4.7737 (2.9420)	**-4.9168*** **(2.8733)**	**-5.0442*** **(2.8286)**	-	-2.8218 (9.9169)	-	-4.9102 (4.4541)	-
(Overall) R^2	0.1158	0.2544	0.2708	0.2807	0.2069	0.2805	0.1024	0.2477	0.8268
N	570	512	570	570	160	160	410	410	34

This table shows firm-year and industry-year regression analyses investigating the association between competition and voluntary disclosure of publicly listed firms in Imperial Germany in the 1890s. *pos_sum* is the number of positions reported in a firm's balance sheet and income statements adjusted for positions related to the distribution of the net income. *ind_sum* is the industry-level mean of *pos_sum. existing* is the negative of PC 1 (see table 7, Panel B) and reflects existing competition. *profit* is PC 2 (see table 7, Panel B) and reflects industry profitability. *potential* is the negative of PC 3 (see table 7, Panel B) and reflects potential competition. *leader* is a binary dummy variable that equals one if the firm's market share ranks within the upper quartile and zero otherwise. A firm's market share is defined as revenues over industry aggregate revenues. *cap_inc* is a binary dummy variable that equals one if the firm raised public equity or debt between January 1, 1890 and December 31, 1895, and zero otherwise. *asset_utilization* is the asset utilization ratio and defined as revenues over total assets. *var_comp* is the variable compensation of the management scaled by net income. *ln_tot_assets* is the natural logarithm of a firms' total assets. *roa* is a firm's net income over total assets. *eq_quota* is equity (capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves) scaled by total assets. Model 8 employs industry-level means of the firm-level variables. All values on the firm-level are as reported by *'Saling's Börsenpapiere' Vol. 15 (1891/1892)* and *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*. Standard errors are clustered at the industry-level and provided in parentheses. Model 9 employs robust standard errors. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level.

Capital Market Effects around Dividend Announcements
An Analysis of the Berlin Stock Exchange in 1895

Abstract

This paper analyzes share price and trading effects around dividend announcements of firms listed on the Berlin Stock Exchange in 1895. Based on a sample of 166 firms, I find a statistically and economically significant positive (negative) cumulative average abnormal return following a positive (negative) dividend surprise. The positive price impact already evolves in advance while the price impact of negative surprises arises at the announcement date. Consistent with the dividend signaling hypothesis these effects are more pronounced for smaller firms and firms providing a lower financial reporting transparency. I furthermore find that trading is increased around the announcements. The effect is negatively associated with a firm's market value and a firm's financial reporting transparency. These findings are consistent with a differential belief revision among individual investors. I also provide descriptive evidence for a strong increase in supply surpluses a few days before the announcement of negative dividend surprises. This is consistent with insiders trading on private information.

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1 Introduction

The feasibility of efficient capital markets in the presence of influential universal banks has been rejected for decades (*Fohlin 2007a*). Recently, a growing body of evidence however supports the co-existence of these banks and efficient capital markets (e.g. *Weigt 2005*; *Baltzer 2007*; *Fohlin 2007b*; *Gelman and Burhop 2008*; *Lehmann 2014*). This study strengthens this position by showing effects on share prices and trading arising from dividend announcements of 166 industrial corporations listed on the Berlin Stock Exchange (BSE) in 1895.

While an analysis of the relevance of the dividend policy for share prices is new in this setting, the analysis itself certainly is not. Ever since *Miller and Modigliani (1961)* showed that a firm's dividend policy should be irrelevant for valuation, empirical evidence has rejected their theory (e.g. *Pettit 1972*; *Amihud and Li 2006*; *Andres et al. 2013* for a recent German example). The prevailing explanatory approaches for this finding are the signaling theory and the free cash flow theory. The first approach identifies dividends as an instrument of managers to signal future performance (*Bhattacharya 1979*; *Miller and Rock 1985*). Price implications arising from a certain dividend policy are consequently driven by the ability of dividends to constitute a separating equilibrium. The second approach identifies dividends as a mechanism to reduce agency conflicts since they reduce the ability of managers to engage in overinvestment (*Rozeff 1982*). Price implications arising from a certain dividend policy are consequently driven by the credibility of a manager's commitment to refrain from overinvestment.

In order to test these theories against each other, I first conduct an event study aiming at the identification of abnormal returns around the dividend announcements. A firm's normal performance is measured by a constant-mean adjusted model, a market model, and a *Fama and French (1993)* three-factor model. Irrespective of the underlying model, I find event-induced (cumulative) aver-

age abnormal returns in a [-5, 4] window around dividend announcements which are surprising to the market. Positive (negative) surprises are associated with positive (negative) cumulative average abnormal returns. Announcements that contain no surprise are not associated with abnormal returns. I also find that positive surprises leak into the market a few days in advance. Negative surprises in contrast exhibit their influence at the dividend announcement date. This is also observable on modern capital markets (*Kothari et al. 2009*).

After the identification of (cumulative) average abnormal returns driven by surprising announcements, I conduct several cross-sectional regression analyses in order to find evidence in support of the signaling theory or the free cash flow theory. I follow prior literature (e.g. *Yoon and Starks 1995*) and expect the signaling effect to be weaker for larger firms. Thus, I include the logarithm of a firm's market value into the regressions. Moreover, I follow *Hail et al. (2014)* and expect the signaling effect to be less pronounced for firms showing a comparably transparent financial reporting. Thus, I employ the voluntary disclosure proxy of *Günther (2015)* as an indicator for the firms' financial reporting transparency.[22] With respect to the free cash flow hypothesis, I follow e.g. *Lang and Litzenberger (1989)* and include Tobin's Q as an indicator for overinvestment into the regressions. Moreover, I use the average industry-level growth between 1890 and 1895 as an indicator for the perceived prospects of a firm's investment program at the dividend announcement date.[23] Finally, I follow *Andres et al. (2013)* and include the earnings surprise to control whether dividends convey information over and above the information contained in earnings.[24] I find a positive association between dividend surprises and market-adjusted cumulative abnormal

[22] *Günther (2015)* utilizes the number of positions displayed in the financial statements of firms listed on the BSE in the 1890s as a proxy for voluntary disclosure.

[23] The cash flow hypothesis actually takes the future outcome of investment opportunities into account. However, the consideration of the realized industry-level growth after 1895 would overlap with the signaling theory. Hence, I focus on the perceived investment opportunities at the dividend announcement date.

[24] There is no official earnings announcement date in my setting. However, the institutional design and the media coverage suggest that earnings and dividends are usually simultaneously provided to the market.

returns over and above earnings surprises. Besides its statistical significance, this association is also economically relevant. An increase of one standard deviation in the dividend surprise is associated with an increase of 1.5 percentage points of the cumulative abnormal return. I furthermore find a negative association between the market-adjusted cumulative abnormal return and the interaction of the dividend surprise and the voluntary disclosure proxy of *Günther (2015)*. Moreover, I find a negative association between the absolute market-adjusted cumulative abnormal return and the logarithm of the market value. Both associations are consistent with the dividend signaling theory. However, I do not find evidence consistent with the free cash flow theory.

(Surprising) public disclosure however does not only induce abnormal returns. *Bamber et al. (2011)* review the literature on trading volumes around public disclosure and find ample support for event-induced trading. Unfortunately, there is no data on trading volumes for the BSE. Thus, I employ a new proxy for trading that comes at the advantage of direct observability. The share prices were supplemented by an indicator showing the relation between demand and supply. While a 'bz' indicates that all orders were executed, a 'G'/'B' indicates that there was only demand/supply for a given share. I exploit these supplements and find evidence for increased trading around the announcements. This is consistent with prior literature modeling event-induced trading. *Kim and Verrecchia (1991, 1997)* consider a pre-announcement trading period, in which trading follows the different endowment of investors with private information and a post-announcement trading period, in which trading follows the differential revision of beliefs. The visual inspection of the [-10, 10] window around the announcements furthermore suggests that smaller firms as well as firms with a comparably less transparent financial reporting experience a stronger increase in trading. This is consistent with the hypothesized differential belief revision, since event-induced trading is more likely to emerge for firms with a higher level of pre-

announcement information disparity (*Ziebart 1990*). My conjectures are again supported by cross-sectional regression analyses.

Finally, I construct a proxy for order imbalances based on the supplements of the share prices. *Kyle (1985)* shows that order imbalances can signal informed trading. Consistent with this notion, I find descriptive evidence for a decrease in supply surpluses between the 7th and the 4th day before the announcement of a negative dividend surprise that is followed by a strong increase in supply surpluses on the 3rd day before the announcement. This pattern is consistent with market participants exploiting their private information. However, I do not find evidence consistent with informed trading around the announcements of positive dividend surprises.

This paper primarily adds to recent endeavors on the quantitative analysis of the historical Berlin Stock Exchange. *Burhop (2011)* and *Lehmann (2014)* find a well-performing primary capital market. *Weigt (2005)* analyzes portfolio returns conditional on market risk premiums for increasing portfolio betas and finds evidence for risk efficiency. *Weigt (2005)* also finds an absence of arbitrage opportunities for cross-listed shares. *Gelman and Burhop (2008)* analyze the autocorrelation of daily returns and find evidence for weak information efficiency. Moreover, prior literature shows that the BSE reacted to regulatory interventions (*Wetzel 1996*), macroeconomic shocks (*Baltzer 2007*) and industry-specific news such as cartel agreements (*Bittner 2005)*. This paper complements this research by adding evidence on market reactions following (surprising) dividend announcements. The findings support the advancing notion that information efficiency is not a phenomenon reserved for modern capital markets. Instead, the BSE already showed a comparable degree of information efficiency 120 years ago, irrespective of the presence of powerful universal banks and the absence of modern capital market regulation. Besides its contribution to the literature on historical capital markets, this study also offers a setting that entails sev-

eral advantages with respect to the corporate finance literature. Firms sparsely provided mandatory (*Franks et al. 2006*) and voluntary (*Günther 2015*) disclosure; at least compared with modern standards. Moreover, firms only announced dividends once a year. My setting therefore facilitates the identification of the dividend announcement effect since there are fewer confounding events while the announcement potentially conveys more relevant information at once.

The remainder of this paper is organized as follows. Section 2 gives an overview about the institutional environment. Section 3 develops hypotheses. Section 4 describes the data, the calculation of the daily returns and the proxies for trading and order imbalances. Section 5 encompasses the empirical analyses. Section 6 concludes.

2 Institutional Background[25]

Politics and Economy

This study analyzes capital market effects around dividend announcements in Imperial Germany in 1895. This period is marked by the peak of the German industrialization. Industries are constantly growing. Especially the year 1895 marks the beginning of a considerable boom (*Hahn 2011*). This situation encourages firms to realize large investments (*Rettig 1978*). This in turn causes significant capital needs from external sources, which are (partly) satisfied by capital markets.[26] The German Empire is organized as a constitutional monarchy since its foundation in 1871. The foreign policy is characterized by the aspiration after global power via imperialism. Cornerstone of the domestic politics in the first half of the 1890s is an incipient social legislation.

The Berlin Stock Exchange

The BSE was founded in 1685. Since the incorporation of stock corporations was heavily restricted before 1870, the exchange initially mainly listed debt instruments and shares of banks,

[25] This chapter is based on *Günther (2015)*.

[26] *Günther (2015)* for example shows an average equity quota of 71% for 285 publicly listed firms in the 1890s. He also shows that 13% of these firms raised additional public equity or debt between 1890 and 1894.

insurance companies and railroads (*Gehrig and Fohlin 2006*). After the liberalization of the incorporation of stock corporations in 1870 and irrespective of the subsequent severe stock market crisis in 1873, the number of listed firms constantly grew to over 600 firms in the mid 1890s (*Weigt 2005*). The BSE was only one out of 14 stock exchanges in Imperial Germany (*Gömmel 1992)*. However, *Wetzel (1996)* shows that the average yearly trading volume of the BSE substantially exceeded those of the other exchanges in Imperial Germany. Performance indices provided for example by *Eube (1998)* or *Ronge (2002)* show a positive development of share prices before World War I. This development was occasionally interrupted by short-term price declines after speculations and fraud. A price-decline in 1891 gave rise to a call for a reinforced investor protection which finally led to a stock exchange law in 1896.

The BSE was open for trading between noon and 3 p.m. from Monday to Saturday.[27] Permissions to trade were distributed by Berlin's merchant league (*Wetzel 1996*). Thus, basically everybody was able to trade on the BSE. Nevertheless, trading via intermediaries was common (*Weigt 2005*). At the end of each trading day official brokers arranged fixing prices by identifying the best possible offset between demand and supply (*Tilly 1975).* Investors were able to inspect the order books before submitting their orders and also to change their orders between the preliminary and the final price setting of the official brokers (*Burhop and Gelman 2011*). Nevertheless, the official brokers were obliged to explicitly announce a potential price change of more than 1% before the final price fixing (*Burhop and Gelman 2011)*. Moreover, the commissioner for shares at the BSE could suspend shares from trading in extraordinary situations (*Tilly 1975*). The usual price quotation was in percentage points of the face value. However, some shares were quoted with their face value. Since I analyze daily returns, I do not consider this difference. The mini-

[27] See *Tilly (1975)* and *Wetzel (1996)* for very detailed discussions on the price setting and the organization of the BSE. Parts of this passage are based on *Burhop and Gelman (2011)*.

mum tick size was 0.05% of the face value. Each transaction was taxed with 0.01% of the underlying transaction value (*Burhop and Gelman 2011*). Over and above the official brokers received a fee of 0.05% of the transaction value (*Gelman and Burhop 2008*). Furthermore, *Saling's Börsenpapiere (1892)* reports that banks and other intermediaries received fees between 0.05% and 0.25% of the underlying transaction value.

Disclosure Regulation and Dividend Announcements

The firms in my sample had to provide financial statements in accordance with the German commercial code (*ADHGB*). Figure 1 depicts the timeline of the events after the fiscal year end. Table 1 shows descriptive statistics on the distances between the events.

[Figure 1 about here]
[Table 1 about here]

Firms were obliged to prepare an annual report encompassing a balance sheet, an income statement, corresponding notes and a management report *(Par. 239 ADHGB)*. Afterwards, the supervisory board had to audit the financial statements *(Par. 225 ADHGB)*. Based on this audit the supervisory board proposed a dividend that had to be approved by the annual shareholder meeting.[28] Most firms announced the dividend proposal after the meeting of the supervisory board with a reference to the tentative nature of the announcement. The proposal was often covered by the media (see Appendix A). Since I want to identify the date, when the information first came into the market and not the date, when the dividend was legally approved, I choose the date of the dividend proposal as dividend announcement date. Since the supervisory board had to audit the financial statements before the dividend proposal, I assume that the earnings became simultaneously known to the market. This is backed by the media coverage, which directly reported on the earnings in many cases (see Appendix A). After the announcement of the proposed dividend,

[28] The shareholder meeting was able to reject the proposal and to engage external auditors for an additional audit of the financial statements (*Par. 239a ADHGB*).

firms immediately announced the annual shareholder meeting. Firms had to distribute the annual report to the shareholders no later than two weeks before this meeting (*Par. 239 ADHGB*). Approximately at this time, the reports were also covered by the media *(Günther 2015)*. Finally, firms had to publish the balance sheet and the income statement in a newspaper and deposit these financial statements at the company register within six months (*Par. 239b, 185c ADHGB*).

3 Hypotheses Development

3.1 Share Price Effects

Miller and Modigliani (1961) show that a firm's dividend policy is irrelevant for valuation. Thus, (unexpected) dividends should not induce abnormal returns on the announcement date. However, empirical studies constantly reject the irrelevance hypothesis (e.g. *Pettit* 1972; *Amihud and Li* 2006). This result holds for the modern German capital market (e.g. *Gugler and Yurtoglu 2003*) as well as for historical capital markets in the US and the UK at the beginning of the 20th century (*Sivakumar and Waymire 1993*; *Braggion and Moore 2011*). Nevertheless, I am to the best of my knowledge the first to investigate dividend announcement effects on the BSE in Imperial Germany. Thus, I initially follow the irrelevance hypothesis.

H1: Share prices do not react to dividend surprises.

Prior studies offer two potential explanations for the empirically observable share price reaction following a dividend surprise. The signaling theory assumes that dividends can be used by the management to signal private information on future firm performance (*Bhattacharya 1979*; *Miller and Rock 1985*). I follow prior literature (e.g. *Yoon and Starks 1995*; *Gugler and Yurtoglu 2003*; *Andres et al. 2013*) and assume that this signaling device is of more importance for small firms facing a comparably low level of visibility and media coverage and thus, a comparably high level of information asymmetry. Furthermore, I follow *Hail et al. (2014),* who find a decrease in the information content of dividends after the mandatory IFRS adoption and hypothesize that the

signaling device is of more importance for firms with a comparably low level of financial reporting transparency. In order to capture the firms' financial reporting transparency, I employ the voluntary disclosure proxy of *Günther (2015)* who utilizes the number of positions displayed in the financial statements.

H2: Share price reactions following dividend surprises are more pronounced for smaller firms and firms providing a lower level of financial reporting transparency.

In contrast, the free cash flow hypothesis argues that dividends constitute a mechanism to reduce ex-post agency conflicts causing overinvestment and empire building since they ensure that excess cash flows are distributed to shareholders (*Rozeff 1982)*. Hence, I follow prior literature (e.g. *Lang and Litzenberger 1989*; *Gugler and Yurtoglu 2003*; *Andres et al. 2013*) and assume that a potential share price reaction to a surprising dividend announcement is more pronounced for firms with poorer investment opportunities. In accordance with these studies, I employ Tobin's Q as a proxy for the quality of a firm's investment program. Moreover, I employ the average industry-level growth between 1890 and 1895 as an indication for the perceived prospects of a firm's investment programs at the dividend announcement date.[29]

H3: Share price reactions following dividend surprises are more pronounced for firms with low levels of Tobin's Q and firms operating in low-growth industries.

3.2 Trading Effects

Prior literature finds that (surprising) public disclosure is associated with increased trading (*Bamber et al. 2011)*. *Richardson et al. (1986)* specifically find this relation for dividend announcements. *Sivakumar and Waymire (1993)* find the relation for the US capital market at the beginning of the 20th century. *Kim and Verrecchia (1991, 1997)* argue that this pattern is attributable to a different endowment with private information in the pre-announcement period among individual investors. This consequently leads to a differential revision of beliefs following the announce-

[29] The average industry-level growth is based on the production indices of *Hoffmann (1965)*.

ment, which induces trading. Hence, I hypothesize increased trading around the dividend announcements.

H4: Trading is increased around dividend announcement.

Prior research primarily captures differences in investors' beliefs by measures based on analyst forecasts (e.g. *Atiase and Bamber 1994*; *Bamber et al. 1997*; *Barron et al. 2009)*. Unfortunately, analyst coverage is not available in my setting. *Ziebart (1990)* considers firm size as a proxy for the pre-announcement differences in beliefs since larger firms are supposedly more transparent and thus entail lower levels of information disparity among investors. I follow this argument and hypothesize that the trading effects are less pronounced for larger firms.[30] I furthermore expect the trading effect to be less pronounced for firms which provide more transparent financial reporting since the level of financial reporting transparency generally enriches the information environment and thus also reduces the pre-announcement information disparity. In order to capture the firms' financial reporting transparency, I once again employ the voluntary disclosure proxy of *Günther (2015)*.

H5: Larger firms and firms providing a higher level of financial reporting transparency experience less pronounced trading effects around dividend announcements.

Prior literature also finds a positive association between the magnitude of a surprise in public disclosure and trading (e.g. *Bamber 1986, 1987*; *Bamber et al. 1997*). These studies argue that extreme surprises are more likely to be associated with differential belief revisions, which is supported by literature showing an increase in the divergence of analysts' forecasts following extreme earnings surprises (*Brown and Han 1992*). However, surprises do not necessarily induce trading. *Bamber and Cheon (1995)* argue that announcements which are a positive surprise to some investors and a negative surprise to other investors induce trading while the share price re-

[30] However, *Barron et al. (2011)* recently observe a positive event-induced association between size and trading.

mains unchanged. Hence, an announcement that is on average not surprising to the market still can induce trading. Thus, I recognize the importance of considering dividend surprises in my analyses but I do not have an expectation how trading is related to them.

3.3 Order Imbalance Effects

Once dividends are announced, they are public information. However, investors might be able to obtain private information on the announcements in advance. The dividend announcement is the result of the preparation of the annual report by the management and the audit of this report by the supervisory board. Hence, firm insiders will be aware of the dividend before it is open to the public. In this situation information leakages to (some) investors are conceivable. *Kyle (1985)* shows that order imbalances can signal private information.[31] If current shareholders obtain private information on the dividend announcements, they induce buy orders (sell orders) once they face a positive (negative) dividend surprise. However, I am not able to restrict the acquisition of private information to one side of the market. If firm outsiders obtain private information on the dividend announcements, they induce buy orders (abstain from buying a share) once they face a positive (negative) dividend surprise. However, it is not crucial which market side is endowed with private information since informed trading increases the likelihood of demand (supply) surpluses before the announcement of positive (negative) dividend surprises in both cases.

H6: Positive (negative) dividend surprises are associated with increases in demand (supply) surpluses before the dividend announcements, if market participants are successful in obtaining private information.

4 Data

4.1 Daily Returns

The data on the daily share prices stems from the stock market list published on a daily basis in the *BBZ* (see Appendix B). The list shows seven sections on equity. Two of these sections relate

[31] However, prior empirical evidence on this hypothesis is mixed (e.g. *Kaniel et al. 2012*; *Kim and Stoll 2012*).

to railway companies, two sections relate to banks, one section relates to mining companies, one section relates to insurance companies and one section relates to 'miscellaneous industrial corporations'.[32] I focus on firms assigned to the last section. I acknowledge that ignoring the four remaining industries is a selection bias. However, I am still able to capture the dividend announcement effects in 17 out of 21 industries. Moreover, my data base is still the most comprehensive data base of daily share prices in Imperial Germany for a single year.[33]

359 shares of industrial corporations were listed on the BSE in 1895. I hand-collect the list entries of these shares for the 302 trading days in 1895 and end up with 108,418 share-day observations. Before I start to adjust the share prices, I identify all daily returns above +5% and below -5% and check the share prices inducing these returns. I cannot rule out that the data still contains errors but I am able to rule out the influence of extreme errors by this.

First, I adjust the share prices with respect to a peculiarity of the Berlin Stock Exchange, namely a guaranteed dividend. Although *Par. 217 ADHGB* prohibited that shares carried an interest component, most firms still guaranteed a dividend of 4% (see Appendix B). Hence, every trade was a compound of two parts, i.e. the transfer of the share itself and the transfer of the guaranteed dividend linked to this share. *Gelman and Burhop (2008: 50)* give an example on this procedure: 'If, for example, a share with a face value of 1,000 Mark, an actual share price of 150 per cent of the face value, and a guaranteed dividend of 4 per cent was traded on 1 July of a given year, the buyer would pay 1,500 Mark for the share […] and 20 Mark for the guaranteed dividend (1,000

[32] For convenience, I use the term 'industrial corporations' for these 'miscellaneous industrial corporations' in this paper. The full set of industrial corporations however does also include mining companies.

[33] The historical capital market data base of the Center for Financial Studies in Frankfurt a. M. contains roughly 700.000 monthly returns between 1871 and 1914 for six major exchanges. *Gelman and Burhop (2008)* collect daily returns for 27 firms between 1892 and 1913. *Gehrig and Fohlin (2006)* collect daily returns for 43/94/114/165 firms in 1880/1890/1900/1910.

Mark times 4 per cent times 180/360 of the year)". Hence, I follow *Gelman and Burhop (2008)* and adjust the daily share prices for the guaranteed dividends.

Second, I adjust the share prices for the detachment of dividends. Most firms detached the dividend after the fiscal year end. However, some firms chose a different point of time. I identify these firms via '*Saling's Börsenpapiere'*. Since dividends were detached before the dividend announcements, investors had to form an expected dividend. A major source for the validation of these expectations was the dividend estimation provided by a commission of experts at the BSE *(Ronge 2002)*. Since firms guaranteed a dividend, share prices were only adjusted for the difference between the expected dividend and the guaranteed dividend *(Gelman and Burhop 2008)*. Hence, in cases where the expected dividend was below the guaranteed dividend the dividend adjustment led to an increase of the share price. Following these considerations, I adjust the share prices at the dividend detachment date.

Third, I adjust the share prices for capital increases and stock splits following *Wetzel (1996)* and *Ronge (2002)*. I obtain the required information from *'Saling's Börsenpapiere'* which offer a time series of a firm's capital changes. Furthermore, the *BBZ* published a list of capital changes twice a year, which e.g. contained details on the subscription rights. Following *Ronge (2002)*, I ignore the dividend disadvantage of the newly issued shares.

The daily share prices after these adjustments constitute the basis for the calculation of the daily returns. The daily return on trading day t is defined as: $daily\ return_t = \frac{share\ price_t}{share\ price_{t-1}} - 1$ However, the commissioner for share prices at the Berlin Stock Exchange was allowed to suspend the trading of shares which were influenced by an opaque trading environment after substantial news in order to give market participants the chance to analyze the news in detail *(Tilly 1975)*. This actually just shifted the price effect to the next trading day *(Wetzel 1996)*. Hence, I replace the

share price on trading day t in the formula with the share price on trading day t+1 in cases where the share price on trading day t was not quoted. The advantage of this extension is an alignment of price effects on trading day t+1 that are actually attributable to events on trading day t. These price effects are most likely already moderated since capital market participants should react less emotionally after they had some time to digest the news. Hence, a finding of a news-induced price effect would become even more robust. The disadvantage of this procedure is a zero daily return on trading day t+1 per definition. However, untabulated results show that my findings are not affected by the extension.

4.2 Trading Proxies

Prior research on trading on the BSE is very scarce since data on trading volumes is not available. *Wetzel (1996)* analyzes tax statistics and estimates an aggregated trading volume of 56 billion Mark for 1895. *Burhop and Gelman (2011)* employ the transaction cost measure of *Lesmond et al. (1999)*. Moreover, *Gehrig and Fohlin (2006)* employ the measure for effective bid-ask spreads of *Roll (1984)* and the *George et al. (1991)* variant of this measure. In contrast to these studies, I employ a more direct proxy for trading that has to the best of my knowledge not been used by prior research. The daily share prices were supplemented with an indicator of the ratio between supply and demand for a given share (see Appendix B). A 'bz' e.g. shows that all orders for a given share were executed, while a 'G'/'B' indicates that there was only demand/supply but no corresponding supply/demand. Between these extreme values share prices could also be supplemented with a 'bz G'/'bz B' which indicates that some orders were executed but that there was still demand/supply. Over and above, a 'et bz G'/'et bz B' indicates that this remaining level of demand/supply was relatively high. Based on this information, I construct *trading_raw* as a proxy for trading. *trading_raw* is a binary variable that equals 1 if the supplement indicates that

the share was traded and 0 otherwise (see Appendix C).[34] I also encode a missing quotation ('--') as 0 since missing quotations are linked to an empty order book. However, a missing quotation could also indicate a suspension from trading. Thus, I differentiate between missing quotations that only occurred for one day and missing quotations that occurred for two or more days in a row. The latter case comprises 87% of all missing quotations which indicates that most missing quotations are due to steady illiquidity. However, I differentiate between the types of missing quotations and also treat a missing quotation as a missing value in untabulated analyses. My findings are not materially affected.

[Figure 2 about here]

Figure 2 shows the average trading in 1895 and reveals a seasonal trend. The figure also depicts that the firms of the dividend announcement sample are more frequently traded than the rest of the market. In order to address these effects in my analyses, I construct two additional proxies for trading. *trading_sample_adj* considers the average sample-level trading and is thus defined as the difference between *trading_raw* and the mean of *trading_raw* of the dividend announcement sample on a given trading day. *trading_firm_adj* considers the average firm-level trading absent the dividend announcement and is thus defined as the difference between *trading_raw* and the firm-level mean of *trading_raw* within the estimation window.

4.3 Order Imbalance Proxy

The share price supplements show demand/supply surpluses. Hence, they are suitable to serve as a proxy for order imbalances. In the extreme cases there was only demand or supply. Hence, I treat these cases as diametrically opposed in my order imbalance proxy (see Appendix D). *order_imbalance* equals 1 if a share price is supplemented with a 'G', and -1 if a share price is sup-

[34] The usage of the share price supplements as a proxy for trading comes at the advantage of a direct observability for each trading day. Considering the scarce alternative sources, my approach is supposed to shed some light on trading on the BSE. However, it is no full-fledged alternative for trading volumes.

plemented with a 'B'. *order_imbalance* equals 0 if the share price is supplemented with a 'bz'. *order_imbalance* also equals 0 in cases of missing quotations. In untabulated analyses, I treat a missing quotation as a missing value. My findings are not affected. The construction of *order_imbalance* finally considers four increments between a balanced order book and an extreme surplus. *order_imbalance* equals 0.33 (-0.33) if the share price is supplemented with a 'bz G' ('bz B') and 0.67 (-0.67) if the share price is supplemented with a 'et bz G' ('et bz B').

4.4 Dividend Announcements

The data on the dividend announcements also stems from the *BBZ*. The stock market list has a subsection on dividends (see Appendix B). At the beginning of a fiscal year the information on the dividend for the expired fiscal year was indicated as missing ('–'). Hence, I compare the stock market list from one day to another and identify the date of the dividend announcement once the subsection shows a dividend. However, this identification strategy is not perfect. The (proposed) dividend was generally announced right after the supervisory board finished its audit of the annual report. However, the dividend still had to be legally approved by the annual shareholder meeting. While this was more of a legal formality, some firms waited for the approval until they announced the dividend at the BSE.[35] Hence, I read the volume 1895 of the *BBZ* to improve the identification of the date when the information on the dividend actually came into the market. Since the *BBZ* covered most of the firms, it also reported on the meeting of the supervisory board and the proposed dividend (see Appendix A). Hence, I replace the date of the dividend announcement at the BSE with the date of the *BBZ* report on the dividend, if possible. In most cases there is only a gap of one or two days between the *BBZ* report and the BSE announcement. Nevertheless, this procedure substantially improves the identification of the date when the news became known to a broad audience.

[35] This is e.g. indicated by the minimum of *Dividend_Announce* in table 1 (-45 days).

While the announced dividend is directly observable, the market expectations can only be derived. I follow a three step procedure with respect to this. First, I identify the last dividend forecast of the *BBZ* before the announcement. If this forecast is not available, I use the dividend estimation provided by the commission of experts for the dividend detachment. If this estimate is also not available, I follow a naïve model and use the prior year's dividend.

5 Empirical Analyses

5.1 Sample Selection, Industry Classification and Descriptive Statistics

[Table 2 about here]

The starting point for the sample selection presented in panel A of table 2 is my database on daily share prices of industrial corporations listed on the BSE in 1895. This database contains information on daily share prices for 359 shares. However, some firms had more than one share type listed on the BSE and I want the sample firms to be equally weighted in the final analyses. Thus, I choose the most often traded share type in these cases, which leads to an exclusion of 33 shares. I furthermore exclude eight firms without a single price quotation in 1895 because I perceive these firms to be unrepresentative for the population of actually traded firms. Finally, I exclude seven firms that were liquidated in 1895 and end up with a population of 311 industrial corporations. Starting from the population, I exclude 9 firms with missing data on the announced dividend, 6 firms with missing data on the expected dividend, 34 firms with missing data on the dividend announcement date and 8 firms with missing data on earnings, total assets or equity. I furthermore exclude 39 firms with missing data on media coverage and 41 firms for which the *BBZ* covered the annual report within less than one week after the dividend announcement. I exclude these firms to reduce the influence of potentially confounding events. Arguably, this introduces a selection bias since firms that are more transparent might be faster in providing the annual report. However, I relax this condition in untabulated analyses and my results are materially unchanged.

Untabulated analyses also show that there are no statistically significant (cumulative) abnormal returns around the media coverage.[36] Furthermore, I enforce a minimum of 100 observations in the estimation window. No firm is excluded due to this restriction. 2 firms, however, announced their dividend very late in 1895. I exclude these firms since my dataset does not allow for an investigation of a ten day event window in these cases. Finally, I exclude 2 (4) firms with more than 50% missing quotations in the estimation (event) window. I also consider the exclusion of firms which have an event window around the crisis of the Imperial Ottoman Bank which induced high negative returns for many firms on November 9, 1895 (*Gelman and Burhop 2008*). I exclude these 13 firms on trial but do not find an effect on my results. Hence, I choose to continue without this exclusion and end up with a final sample of 166 firms. Panel B presents the industry classification in accordance with *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*. The three largest industries (breweries, engineering and railroad supply, and construction) represent more than one third of the population while the three smallest industries (glass and porcelain, clothes and hats, and sugar factories) represent only roughly 6.5% of the population. Panel B shows that the sample is representative for the population. Table 3 shows descriptive statistics.

[Table 3 about here]

Panel A shows summary statistics at the firm-level of the sample. The market values are considerably right-skewed distributed. The smallest firm has a market value of 196,554 Mark while the largest firm has a market value of 88,910,856 Mark.[37] This is not surprising since the BSE does not define segments with respect to firm size or trading volume. However, this is also an advantage since prior studies on dividend announcements in modern markets often focus on special segments (e.g. *Andres et al. 2013*) while I am able to show more general results. To address the

[36] In these analyses, I group the firms according to the dividend surprise, the difference between the firm-level return on assets and the industry-level mean (median) of the return on assets, and the extent of the media coverage (*BBZ_Lines* in table 1).

[37] *Wehler (1994)* estimates an annual per-capita income of 505 Mark for the 1890s. Hence, my sample firms are economically meaningful.

skewness of the distribution I employ logarithmic market values in the cross-sectional regression analyses. In contrast, Tobin's Q is less heterogeneously distributed.[38] While the average firm shows a Tobin's Q of 1.4587, the most valuable firm shows a Tobin's Q of 4.6927. The firms pay an average dividend of 7.73%.[39] The maximum dividend of 130% might appear as a typo, but it is not. This extreme dividend was paid by the 'Deutsche Glasglühlicht AG' which distributed the light bulb in Imperial Germany. However, while this dividend and many others were no surprise to the market (median of *dividend_surprise*: 0.00), some announcements were unexpected. The maximum negative surprise is 12% lower than the expected dividend while the maximum positive surprise is 8% higher than the expected dividend. The example in Appendix A indicates that my assessment of a dividend surprise correctly represents the actual situation. The firms are on average profitable (mean of roa_{94}: 0.0605). The distribution of the earnings surprises suggests that this profitability was relatively constant over time (interquartile range of *earnings_surprise*: 0.0220).[40] My sample firms report on average 34.7831 positions in their financial statements. The correlations of the firm-level variables are presented in panel B. Firms showing a higher market value pay more dividends, are more profitable, more transparent and tend to operate in high-growth industries. Dividends are highly positively correlated with the return on assets. Dividend surprises are highly positively correlated with earnings surprises.

Panel C, D and E provide descriptive statistics at the firm-day level of the population and the dividend announcement sample. The daily return averages 0.06% in both cases. It is difficult to compare this finding with prior research since these studies use different observations periods and numbers. *Gelman and Burhop (2008)* for example find a mean daily return of 0.02% for 27

[38] Tobin's Q is defined as (total assets – book value of equity + market value of equity – book value of listed bonds + market value of listed bonds) divided by total assets.
[39] These percentage points are based on the face value of the shares. A firm with a capital stock of 100,000 Mark paying a dividend of 10,000 Mark hence pays a dividend of 10%.
[40] The earnings surprise is defined as the difference in the return on assets to the preceding fiscal year.

shares between 1892 and 1913. 17 of these shares are also part of the population of industrial corporations. Using my dataset the mean daily return of these shares averages 0.04%. While this is twice as high as the result of *Gelman and Burhop (2008)* it is still not completely contradictory. Some of the daily returns show extreme values. Nevertheless, untabulated analyses show that only 329 daily returns are below -5% and 353 daily returns are above +5% which is altogether less than 1% of all daily returns. Furthermore, I identify 120 shares which were traded on at least 200 out of 302 trading days to construct a market portfolio. This market portfolio shows an average return of 0.06% and a reasonable variation in returns in 1895. The shares are on average relatively frequently traded (mean of *trading_raw*: 0.5425). The distribution of *order_imbalance* reveals that demand surpluses occur more often than supply surpluses (median of *order_imbalance*: 0.3300). The results furthermore confirm the impression of figure 2 that the sample firms are on average more frequently traded than the rest of the population. The correlations show that *daily_return* is positively correlated with *trading_raw*, which is consistent with prior literature (*Karpoff 1987*; *Burhop and Gelman 2011*). Moreover, *trading_raw* is negatively correlated with *order_imbalance*, which reflects that demand/supply surpluses occur due to a missing offsetting supply/demand and hence missing trading.

Panel F and G finally present descriptive statistics at the firm-day level for the sample within the [-5, 4] event window. The mean *daily_return* equals the mean *daily_return* of the population. However, the extreme values of *daily_return* are considerably lower. The shares are more frequently traded within the event window (mean of *trading_raw*: 0.7500). This finding is robust against the consideration of the average firm-level trading level outside the event window (mean of *trading_firm_adj*: 0.1315). The higher occurrence of demand surpluses is known from the analysis of the population. This also applies to the correlations.

5.2 Share Price Effects around Dividend Announcements

In order to analyze the share price effects around the dividend announcements, I first conduct an event study. I analyze the effect in a short window of ten days, i.e. from the fifth day before the announcement to the fourth day after the announcement. Figure 1 shows that I divide the estimation window into two parts. It is common practice in prior literature to define the estimation window only before the event. However, I only have a single year of daily returns and I do not want to lose further observations due to this restriction.[41] The first part of the estimation window ranges from January 1, 1895, to the 31st day before the dividend announcement. The second part ranges from the 31st day after the official publication of the balance sheet and the income statement to December 31, 1895. If the date of the official publication of the balance sheet and the income statement is not available, I enforce a minimum distance of 100 days between the dividend announcement and the start of the second part of the estimation window. In order to measure expected returns, I first use a market model. The market return is based on 120 equally weighted shares that were at least traded on 200 out of 302 trading days. Second, I use a constant mean-adjusted return model. Third, I use a *Fama and French (1993)* three-factor model. For this model, I divide the sample into quintiles according to the firms' market values, respectively book to market ratios. The differences in the mean daily returns between the portfolio of the upper two quintiles and the portfolio of the lower two quintiles serve as HML and SMB factors. Table 4 presents the results of the event studies. Figure 3 and 4 visualize the results.

[Table 4 about here]

[Figure 3 about here]

[Figure 4 about here]

[41] Nevertheless, untabulated analyses show that my findings are robust against the exclusion of the post-event estimation window.

Firms announcing an expected dividend do not experience significant (cumulative) average abnormal returns in the event window. Firms announcing a negative dividend surprise show a significant negative average abnormal return on the day of the dividend announcement and the following two days. Firms announcing a positive dividend surprise already show a significant positive average abnormal return three days before the dividend announcement that lasts until the day after the announcement. Day three and four after the positive dividend surprise are marked by a statistically significant negative average abnormal return which is consistent with an adjustment of the market after the favorable news. Taken together, I have to reject the irrelevance hypothesis of *Miller and Modigliani (1961)*. Dividend surprises evolve an influence on share prices in my setting, just as they do on modern capital markets. The results furthermore show that good news leak in advance while managers tend to postpone the release of bad news as long as possible.[42] This strategic behavior is also known from firms on modern capital markets (*Kothari et al. 2009*). The results are not materially affected by the model for the expected normal returns which emphasizes the robustness of my findings. Panel A of table 5 furthermore shows the results of cross-sectional regression analyses that support the rejection of the irrelevance hypothesis.

[Table 5 about here]

Model (1) shows a statistically significant positive association between the dividend surprise and the abnormal share price reaction over and above the earnings surprise. The effect is also economically relevant. An increase of one standard deviation in *dividend_surprise* is associated with an increase of 1.5 percentage points of the cumulative abnormal return. In model (2), I analyze all daily returns in 1895. The results do not show a statistically significant association between daily returns and a binary dummy variable that equals 1 if the return occurs in the [-5, 4] event win-

[42] However, t-tests reveal that the difference between the cumulative average abnormal returns of firms announcing positive surprises and firms announcing negative surprises is statistically significant from the day before the announcement onwards (see table 4). Thus, the effect is weaker than potentially suggested by figure 4.

dow. I do not find a statistically significant association between daily returns and the dividend surprises, either. The interaction between *dividend_surprise* and *event_window* however is statistically significantly positively associated with the daily returns. Model (2) furthermore shows a positive association between *trading_sample_adj* and daily returns. This relation has also been reported by prior research (*Burhop and Gelman 2011*). Moreover, I find a positive but insignificant association between *beta* and daily returns. *Weigt (2005)* also finds a positive but insignificant association between beta factors and monthly returns between 1891 and 1895. *Boassaerts and Fohlin (2000)* find a positive association between beta factors and annual returns between 1881 and 1913. *Fohlin and Reinhold (2010)*, in contrast, find a negative association between beta factors and monthly returns between 1904 and 1910. However, these studies use different time periods, smaller samples and monthly (annual) returns while my study investigates daily returns of a larger sample within a single year. Hence, it is difficult to compare my results with prior research.

After the rejection of my first hypothesis, I investigate the cross-section of the (absolute) cumulative abnormal returns to find evidence in support of the signaling theory or the free cash flow theory. The results are presented in panel B and C of table 5. Model (1), (2) and (5) of panel B show a significant negative association between the cumulative abnormal returns and the interaction of *dividend_surprise* and a binary dummy variable that equals 1, if the firm reports at least the median number of positions in its financial statements. However, I do not find significant associations for the interaction effects of *dividend_surprise* and *large_ln_market_value, large_ind_5y_growth*, or *large_tobins_q*. Model (3), (4) and (5) of panel C show a significant negative association between *ln_market_value* and the absolute cumulative abnormal returns. However, I do not find significant associations between the absolute cumulative abnormal returns and *pos_reported*, *ind_5y_growth*, or *tobins_q*. Taken together, I do not find evidence consistent

with the free cash flow hypothesis. However, the results support the signaling hypothesis. It is difficult to link this evidence to the modern German capital market since empirical evidence is mixed. *Heiden (2002)* and *Andres et al. (2013)* reject the free cash flow theory. However, *Kaserer et al. (2002)* and *Gugler and Yurtoglu (2003)* find evidence consistent with this theory.

5.3 Trading Effects around Dividend Announcements

To investigate the trading effects around the dividend announcements, I first visually inspect the attributes of *trading_raw*, *trading_sample_adj* and *trading_firm_adj* in a [-10, 10] window and a [-50, 50] window around the announcements. Figure 5 shows the results of this analysis.

[Figure 5 about here]

The figure shows that trading is increased around the announcements irrespective of the underlying trading proxy. This is consistent with theories on event-induced trading (*Kim and Verrecchia 1991*, *1997*) and thus, consistent with hypothesis 4. Investors are differently endowed with private information on the dividends after the fiscal year end. Consequently, trading arises from the differences in beliefs among investors. Since there are no regulated events between the fiscal year end and the announcement, the pattern is unlikely to arise from confounding events. Figure 6, 7, and 8 show the attributes of *trading_raw*, *trading_sample_adj* and *trading_firm_adj* within a [-10, 10] window around the announcements conditional on firm size, financial reporting transparency and the magnitude of the dividend surprise.

[Figure 6 about here]

[Figure 7 about here]

[Figure 8 about here]

Figure 6 reveals that trading of small and medium sized firms is increased after the dividend announcement. The inspection of large firms does not yield an obvious result since large firms seem

to experience a sharp decrease in trading right after the announcement. Moreover, trading of large firms is comparably more volatile within the [-10, 10] window. Thus, it is difficult to identify a clear pattern for these firms. However, the findings are generally consistent with the notion that investors of smaller firms face a larger disparity in pre-announcement information endowment since these firms are principally less transparent. This consequently leads to a higher level of trading after the announcement due to the differential belief revision (*Ziebart 1990)*. This argument can also be applied to the effects presented in figure 7. Firms providing less transparent financial statements experience more pronounced trading effects after the dividend announcement. Firms that provide highly transparent financial statements do not experience this effect. Taken together, the findings are consistent with hypothesis 5. Figure 8 furthermore shows that firms announcing a positive dividend surprise show an increase in trading after the announcement. This also applies to firms announcing an expected dividend. Firms announcing a negative dividend surprise, however, show a decrease in trading after the announcement while trading is generally increased around the announcement. This decrease is partly due to technical issues since negative dividend surprises are associated with high negative price impacts. Consequently, it is more likely that these shares were suspended from trading. I exclude shares with no quotation after the dividend announcement in untabulated analyses and still find a decrease in trading. However, the decrease is less sharp. Thus, suspension from trading does not fully explain the observable pattern. Nevertheless, theoretical guidance does not predict a clear trading effect arising from dividend surprises, anyway. Instead, prior literature argues that announcements that are on average no surprise to the market can still induce high levels of trading if investors were differently endowed with information in the pre-announcement period and/or interpret the announcement differently (*Bamber and Cheon 1995; Kandel and Pearson 1995*). To further cor-

roborate my impressions, I conduct several cross-sectional regression analyses. Table 6 presents the results of these analyses.

[Table 6 about here]

First, I employ a logit regression using *trading_raw* as dependent variable. The results show a positive association between firm size and trading. This association is intuitive and known from modern markets since both, large (*Atiase 1985*) and small (*Barber and Odean 2008*) investors, are attracted by large firms. I furthermore observe a positive association between earnings surprises and trading throughout the year. However, the association is rather weak. Moreover, I find a statistically significant positive association between *trading_raw* and a binary dummy variable that equals 1, if the trading day lies within the [-5, 4] event window. This shows that shares are indeed more frequently traded around the dividend announcements. Furthermore, I employ an OLS regression using *trading_sample_adj* as dependent variable. The results support the findings of model (1). Taken together, the acceptance of hypothesis 4 is backed by my cross-sectional evidence. In order to test hypothesis 5, I employ *trading_firm_adj* as dependent variable. The results are presented in model (3) - (11). First, I analyze the [-10, 10] window around the announcements. I find a significant negative association between *trading_firm_adj* and *ln_market_value* as well as a significant positive association between *trading_firm_adj* and *dividend_surprise*. The association between *trading_firm_adj* and *pos_reported* is also negative but insignificant. Model (6) - (11) reveal that the moderating effect of firm size and financial reporting transparency arises in the post-announcement period. Taken together, the acceptance of hypothesis 5 is backed by my cross-sectional evidence. Firms featuring a richer information environment are associated with lower levels of pre-announcement information disparity. This reduces the likelihood of a differential belief revision among investors, which mitigates the trading effects following dividend announcements.

5.4 Order Imbalance Effects around Dividend Announcements

[Figure 9 about here]

Finally, I analyze order imbalances around the dividend announcements in order to explore the presence of informed trading. The results are presented in figure 9. The inspection of figure 9a and figure 9b does not yield an obvious result. Figure 9c however shows a considerable increase in demand surpluses between the 7th and 4th day before a negative dividend surprise that is accompanied by a considerable increase in supply surpluses on the 3rd day before the announcement. This suggests that market participants wait for the arrival of the private information and after facing a negative surprise immediately divest, respectively abstain from buying shares. Hence, I find evidence consistent with hypothesis 6 for negative dividend surprises but I do not find evidence consistent with hypothesis 6 for positive dividend surprises. However, the findings must be carefully interpreted. First, I am not able to draw causal inferences especially since I am not able to restrict private information acquisition to one side of the market. Second, my proxies are only very raw indicators of the trading patterns on the BSE.

5.5 Robustness Checks

To validate my results I perform various robustness checks. First, I review the construction of the expected returns. I relax the conditions of the market portfolio and include all 311 firms. I tighten the restriction and include the 50 most often traded firms into the market portfolio. Furthermore, I only use the mean daily returns of the portfolios of the upper and lower quintile of the distribution of market values and the book to market ratio as SMB and HML factors in the *Fama and French (1993)* three-factor model. All these changes do not affect my findings.

The second set of analyses considers the influence of the dividend estimates. First, I exclude 46 firms for which I apply the naïve estimation model. This model assumes that there was no information on the dividends for approximately one year, which is a very strong assumption. The ex-

clusion does not materially influence the findings of the event study. However, the negative cumulative abnormal return following a negative dividend surprise becomes insignificant. This is likely due to the lower numbers of negative dividend surprises employed in this robustness check (N_{neg}=20). The results of the cross-sectional analyses of hypothesis 2 and 3 also become insignificant which is again likely due to the lower number of observations. Afterwards, I ignore the dividend estimates of the *BBZ* and the commission of experts at the BSE and employ a naïve estimation model for all firms. The results are again not materially affected by this. This indicates that neither the *BBZ* nor the commission of experts at the BSE provided dividend estimates that were superior to the naïve model.

Moreover, I exclude the second part of the estimation window to ensure that my results are not driven by a structural break in daily returns after the dividend announcement. This considerably decreases the sample (N=69). Figure 10 visualizes the consequences of this reduction.

[Figure 10 about here]

The figure shows that an exclusion of the second part of the estimation window does not affect my findings since positive (negative) dividend surprises are still associated with positive (negative) cumulative average abnormal returns. However, firms announcing an expected dividend seem to experience negative abnormal returns around the announcements. This is likely attributable to the low number of observations (N_{no} = 26) and to the strict definition of an unsurprising dividend. I treat a dividend as unsurprising if and only if there is no deviation between the announced and the expected dividend. Hence, it is likely that I treat dividends as unsurprising that are a surprise to the market. While this effect is smoothed in the larger sample of the main tests, the smaller sample of the robustness check is more affected by this design choice.

Furthermore, I analyze whether the trading effects around the dividend announcements are attributable to a seasonal clustering of announcements. I find such a seasonality since 75 out of 166 firms announce their dividends within the first quarter of 1895, while 24/41/26 firms announce their dividend within the second/third/fourth quarter. Hence, I exclude firms which announced their dividend in the first quarter. Figure 11 shows the results.

[Figure 11 about here]

The figure shows that there is still an increase in trading around the announcements. However, the effect seems to be slightly weaker. Nevertheless, the analyses of the trading effects must be carefully interpreted anyway as I employ rather raw proxies. Considering the scarce alternative information sources and consequently the scarce prior evidence, the results are supposed to grant a cautious glimpse on trading on the BSE but not a full resilient picture.

6 Conclusion

This study shows that the Berlin Stock Exchange in 1895 reacted to dividend announcements. By analyzing market reactions around the announcements of 166 firms, I find statistically and economically significant positive (negative) cumulative average abnormal returns following a positive (negative) dividend surprise. I furthermore find that the effect of positive surprises is already initiated a few days in advance while the effect of negative surprises arises at the announcement date. In addition, cross-sectional analyses support the dividend signaling hypothesis since the strength of the effect is moderated by firm size and a firm's financial reporting transparency. However, I do not find evidence consistent with the free cash flow hypothesis. I also find an increase in trading around the announcements. This is also supported by cross-sectional regression analyses. These analyses also provide evidence for a moderated trading effect conditional on firm size and a firm's financial reporting transparency. Finally, I find a strong increase in supply surpluses on the 3rd day before the announcement of negative dividend surprises. This is consistent

with informed trading. However, I do not find a trading pattern before the announcements of positive surprises that supports this notion. All these effects have been extensively reported on modern capital markets. However, I am to the best of my knowledge the first to show these effects on the BSE before World War I. Considering recent quantitative literature on historical German capital markets (e.g. *Weigt 2005; Baltzer 2007; Fohlin 2007b; Gelman and Burhop 2008; Burhop 2011*) my findings might not be unexpected. However, they complement this stream of literature and underline the information efficiency of a capital market that operated 120 years ago in the presence of influential universal banks and in the absence of modern capital market regulation.

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Appendix A: Example of a Surprising Dividend Announcement

- Firm: Chemnitzer Werkzeugmaschinen-Fabrik, vorm. Joh. Zimmermann
- Industry: Engineering and Railroad Supply
- Fiscal Year End: June 30, 1895
- Dividend Announcement: August 31, 1895
    - Expected Dividend: no forecast in the *BBZ* identified, no forecast by commission of experts at the BSE identified, 6% dividend announced in 1894
    - Announced Dividend: 3% (see the following coverage of the *BBZ*)

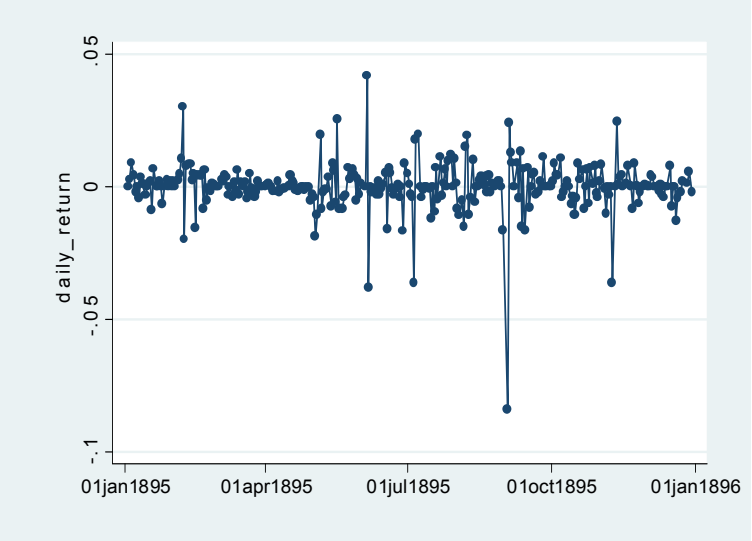
— In einer gestern stattgehabten Sitzung des Aufsichtsrathes der **Chemnitzer Werkzeugmaschinen-Fabrik, vorm. Joh. Zimmermann in Chemnitz** gelangte der Abschluss pro 1894/95 zur Vorlage. Derselbe ergiebt einen Bruttogewinn von 333 633 Mark (gegen 515 239 ℳ im Vorjahre). Nach Vornahme der üblichen Abschreibungen etc. wurde die Dividende auf 3 % festgesetzt (gegen 6 % im Vorjahre).

'Yesterday, a meeting of the supervisory board of the Chemnitzer Werkzeugmaschinen-Fabrik, vorm. Joh. Zimmermann in Chemnitz took place, in which the annual report 1894/95 was presented. The report shows a gross profit of 333,633 Mark (against 515,239 M in the previous year). After considering the usual depreciation etc. the dividend was fixed to 3% (against 6% in the previous year).

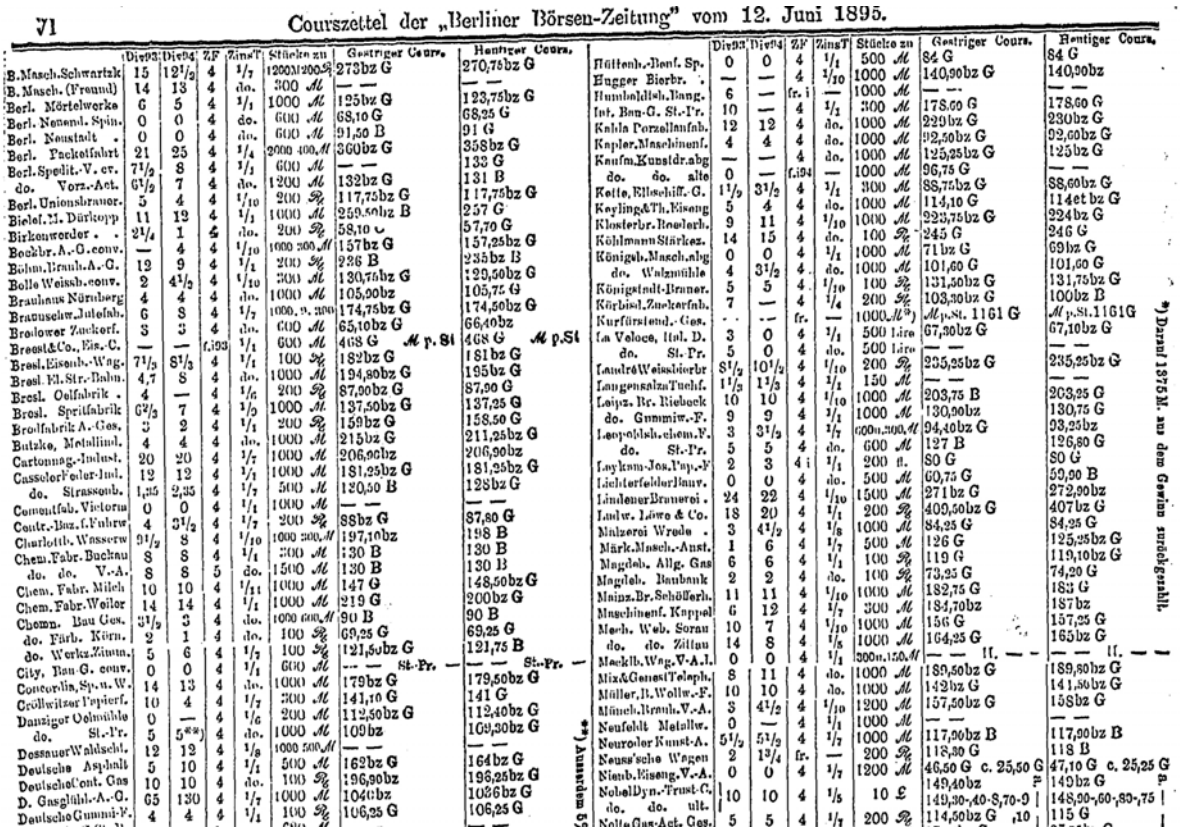
- Share Price Development within Event Window

Date	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30
Share Price	119.40 bz G	119.50 bz G	119.75 bz G	120 B	120 bz B
Date	Aug 31	Sep 3	Sep 4	Sep 5	Sep 6
Share Price	118 bz B	108 et bz G	110.60 bz	112 G	113 et bz G

Figure A1: Daily Returns of Chemnitzer Werkzeugmaschinen-Fabrik in 1895



Appendix B: *BBZ* Stock Market List



71 Courszettel der „Berliner Börsen-Zeitung" vom 12. Juni 1895.

	Div93	Div94	ZF	ZinsT	Stücke zu	Gestriger Cours.	Heutiger Cours.
B.Masch.Schwartzk	15	12½	4	1/1	1200M1200	273bz G	270,75bz G
B. Masch. (Freund)	14	13	4	do.	300 M	— —	— —
Berl. Mörtelwerke	6	5	4	1/1	1000 M	125bz G	123,75bz G
Berl. Nenend. Spin.	0	0	4	do.	600 M	68,10 G	68,25 G
Berl. Neustadt .	0	0	4	do.	600 M	91,50 B	91 G
Berl. Packetfahrt	21	25	4	1/4	2000 400,M	360bz G	358bz G
Berl. Spedit.-V. cv.	7½	8	4	1/1	600 M	— —	133 G
do. Vorz.-Act.	6½	7	4	do.	1200 M	132bz G	131 B
Berl. Unionsbrauer.	5	4	4	1/10	200 Rt	117,75bz G	117,75bz G
Bielef. M. Dürkopp	11	12	4	1/1	1000 M	259,50bz B	257 G
Birkenwerder . .	2¼	1	4	do.	200 Rt	58,10 ⌣	57,70 G
Bockbr. A.-G. conv.	—	4	4	1/10	1000 200,M	157bz G	157,25bz G
Bohm. Braun. A.-G.	12	9	4	1/1	200 Rt	226 B	225bz B
Bolle Weissb. conv.	2	4½	4	1/10	300 M	130,75bz G	129,50bz G
Brauhaus Nürnberg	4	4	4	do.	1000 M	105,90bz	105,75 G
Braunschw. Juliusb.	6	8	4	1/1	1000, 2, 200	174,75bz G	174,50bz G
Bredower Zuckerf.	3	3	4	do.	600 M	65,10bz G	66,40bz
Bresl&Co., Eis.-C.	—	—	f.193	1/1	600 M	468 G M p. St	468 G M p.St
Bresl. Eisenb.-Wag.	7½	8⅓	4	1/1	100 Rt	182bz G	181 bz G
Bresl. El. Str.-Bahn.	4,7	8	4	do.	1000 M	194,80bz G	195bz G
Bresl. Oelfabrik .	4	—	4	1/6	200 Rt	87,90bz G	87,90 G
Bresl. Spritfabrik	6⅔	7	4	1/9	1000 M	137,50bz G	137,25 G
Brodfabrik A.-Ges.	3	2	4	1/1	200 Rt	159bz G	158,50 G
Butzke, Metallind.	4	4	4	do.	1000 M	215bz G	211,25bz G
Cartonnag.-Indust.	20	20	4	1/7	1000 M	206,90bz	206,90bz
Cassler Feder-Ind.	12	12	4	1/1	1000 M	181,25bz G	181,25bz G
do. Strassenb.	1,35	2,35	4	1/7	500 M	120,50 B	128bz G
Cementfab. Victoria	0	0	4	1/1	1000 M	— —	— —
Centr.-Bur. f. Fahrw	4	3½	4	1/7	200 Rt	88bz G	87,80 G
Charlottb. Wasserw	9½	8	4	1/10	1000 200,M	197,10bz	198 B
Chem. Fabr. Buckau	8	8	4	1/1	300 M	130 B	130 B
do. do. V.-A.	8	8	5	do.	1500 M	130 B	130 B
Chem. Fabr. Milch	10	10	4	1/11	1000 M	147 G	148,50bz G
Chem. Fabr. Weiler	14	14	4	1/1	1000 M	219 G	200bz G
Chemn. Bau Ges.	3½	3	4	do.	1000 600,M	90 B	90 B
do. Färb. Körn.	2	1	4	do.	100 Rt	69,25 G	69,25 G
do. Werkz. Zimm.	5	6	4	1/7	100 Rt	121,50bz G	121,75 B
City. Bau G. conv.	0	0	4	1/1	600 M	— — St.-Pr. —	— — St.-Pr. —
Concordia, Spin. W.	14	13	4	do.	1000 M	179bz G	179,50bz G
Crollwitzer Papierf.	10	4	4	1/7	300 M	141,10 G	141 G
Danziger Oelmühle	0	—	4	1/6	200 M	112,50bz G	112,40bz G
do. St.-Pr.	5	5**	4	do.	1000 M	109bz	109,30bz G
Dessauer Waldschl.	12	12	4	1/8	1000 500,M	— —	— —
Deutsche Asphalt	5	10	4	1/1	500 M	162bz G	164bz G
Deutsche Cent. Gas	10	10	4	do.	100 Rt	196,90bz	196,25bz G
D. Gasglühl.-A.-G.	65	130	4	1/7	1000 M	1046bz	1026bz G
Deutsche Gummi-F.	4	4	4	1/1	100 Rt	106,25 G	106,25 G
Hüttenb.-Bonf. Sp.	0	0	4	1/1	500 M	84 G	84 G
Hugger Bierbr. .	—	—	4	1/10	1000 M	140,90bz G	140,90bz
Humboldtsh. Bang.	6	—	fr. i	—	1000 M	— —	— —
Int. Bau-G. St.-Pr.	10	—	4	1/1	300 M	178,60 G	178,60 G
Kabla Porzellanfab.	12	12	4	do.	1000 M	229bz G	230bz G
Kapler. Maschinenf.	4	4	4	do.	1000 M	92,50bz G	92,60bz G
Kaufm. Kunstdr. abg	—	—	4	do.	1000 M	125,25bz G	125bz G
do. do. alte	0	—	f.194	—	1000 M	96,75 G	— —
Kette, Eilschiff. G.	1½	3½	4	1/1	300 M	88,75bz G	88,60bz G
Keyling&Th. Eisenq	5	4	4	do.	1000 M	114,10 G	114et bz G
Klosterbr. Roselerh.	9	11	4	1/10	1000 M	223,75bz G	224bz G
Köhlmann Stärkez.	14	15	4	do.	100 Rt	245 G	246 G
Königsb. Masch. alg	0	0	4	1/1	1000 M	71bz G	69bz G
do. Walzmühle	4	3½	4	do.	1000 M	101,60 G	101,60 G
Königstadt-Brauer.	5	5	4	1/10	100 Rt	131,50bz G	131,75bz G
Körbisd. Zuckerfab.	7	—	4	1/4	200 Rt	103,30bz G	100bz B
Kurfürstend.-Ges.	- .	--	fr.	—	1000 M*)	M p.St. 1161 G	M p.St. 1161G
La Veloce, Ital. D.	3	0	4	1/1	500 Lire	67,30bz G	67,10bz G
do. St. Pr.	5	0	4	do.	500 Lire	— —	— —
Landré Weissbierbr	8½	10½	4	1/10	200 Rt	235,25bz G	235,25bz G
Langensalza Tuchf.	1½	1⅓	4	1/1	150 M	— —	— —
Leipz. Br. Riebeck	10	10	4	1/10	1000 M	203,75 B	203,25 G
do. Gummiw.-F.	9	9	4	1/1	1000 M	130,90bz	130,75 G
Lengelsh. chem. F.	3	3½	4	1/7	600n.300,M	94,40bz G	93,25bz
do. St.-Pr.	5	5	4	do.	600 M	127 B	126,80 G
Leykam-Jos. Pap.-F	2	3	4 i	1/1	200 fl.	80 G	80 G
Lichterfelder Baur.	0	0	4	do.	500 M	60,75 G	59,90 B
Lindener Brauerei .	24	22	4	1/10	1500 M	271 bz G	272,90bz
Lindw. Löwe & Co.	18	20	4	1/1	200 Rt	409,50bz G	407bz G
Malzerei Wrede .	3	4½	4	1/8	1000 M	84,25 G	84,25 G
Märk. Masch.-Anst.	1	6	4	1/7	500 M	126 G	125,25bz G
Magdeb. Allg. Gas	6	6	4	1/1	100 Rt	119 G	119,10bz G
Magdeb. Baubank	2	2	4	do.	100 Rt	73,25 G	74,20 G
Mainz. Br. Schöfferh.	11	11	4	1/10	1000 M	182,75 G	183 G
Maschinenf. Koppel	6	12	4	1/7	300 M	184,70bz	187bz
Mech. Web. Sorau	10	7	4	1/10	1000 M	156 G	157,25 G
do. do. Zittau	14	8	4	1/8	1000 M	164,25 G	165bz G
Macklb. Wag.-V.-A. I.	0	0	4	1/1	300n.150,M	— — M. — —	— — M. — —
Mix&Genest Teleph.	8	11	4	do.	1000 M	189,50bz G	189,80bz G
Möller, B. Wollw.-F.	10	10	4	do.	1000 M	142bz G	141,50bz G
Münch. Brauh. V.-A.	3	4½	4	1/10	1200 M	157,50bz G	158bz G
Neufeldt Metallw.	0	—	4	1/1	1000 M	— —	— —
Neuroder Kunst-A.	5½	5½	4	1/7	1000 M	117,90bz B	117,90bz B
Neuss'sche Wagen	2	1¾	fr.	—	200 Rt	118,80 G	118 B
Niemb. Eisenq. V.-A.	0	0	4	1/7	1200 M	46,50 G c. 25,50 G	47,10 G c. 25,25 G
Nobel Dyn.-Trust-G.	10	10	4	1/5	10 £	149,40bz	149bz G
do. do. ult.						149,30-,40-S,70-9	148,90-,60-,80-,75
Nolte Gas-Act. Ges.	5	5	4	1/7	200 Rt	114,50bz G ,10	115 G

*) Darauf 1875 M. aus dem Gewinn zurückgezahlt.

This Appendix shows an excerpt from the stock market list of June 12, 1895 published in the *'Berliner Börsen-Zeitung'*. The left column contains the name of the firm and in cases of more than one share type per firm also the name of the share type. The columns labeled as 'Div93' and 'Div94' contain the dividends for the last two expired fiscal years. The columns labeled as 'ZF' and 'ZinsT' contain the level of the guaranteed dividend and the due date of this guaranteed dividend, which is concurrently the day after the fiscal year end. The column labeled as 'Stücke zu' contains the face value(s) of the shares. The two columns on the right-hand side show the price of the last trading day and the present trading day.

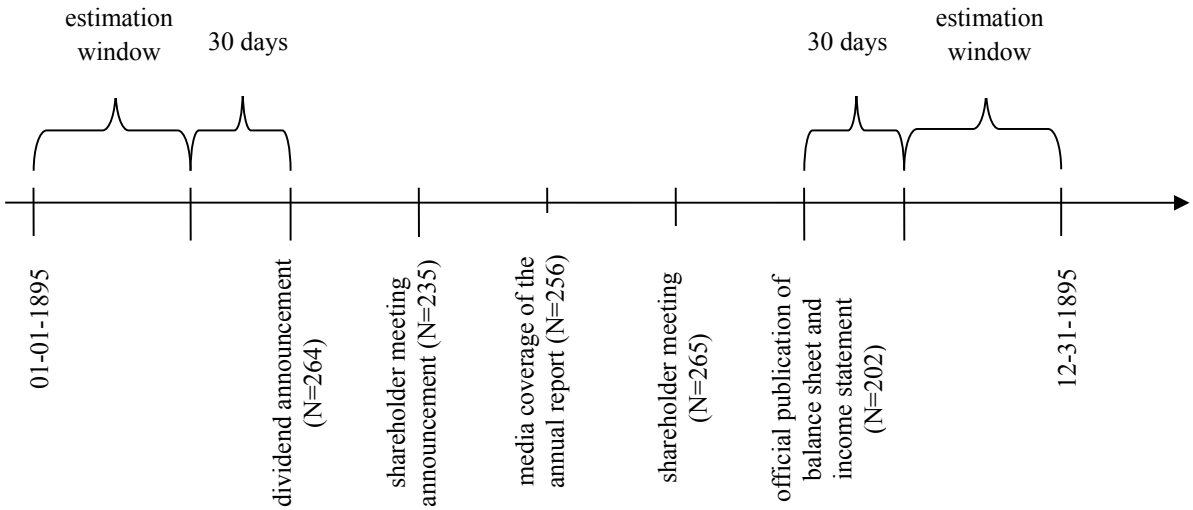
Appendix C: Construction of Trading Proxies

Variable	Value	Stock List Entry	Description
trading_raw	0.00	G / B / --	demand only / supply only / no quotation
	1.00	et bz G / et bz B / bz G / bz B / bz	some orders executed, but still a high level of demand left / some orders executed, but still a high level of supply left / some orders executed, but still demand left / some orders executed, but still supply left / all orders executed, no demand or supply left
trading_sample_adj	[-1.00, 1.00]		*trading_sample_adj* for a given firm on a given day is the difference between *trading_raw* and the mean of *trading_raw* of the dividend announcement sample (N=166) on a given day
trading_firm_adj	[-1.00, 1.00]		*trading_firm_adj* for a given firm on a given day in the event window is the difference between *trading_raw* and the mean of *trading_raw* for a given firm within the estimation window

Appendix D: Construction of Order Imbalance Proxy

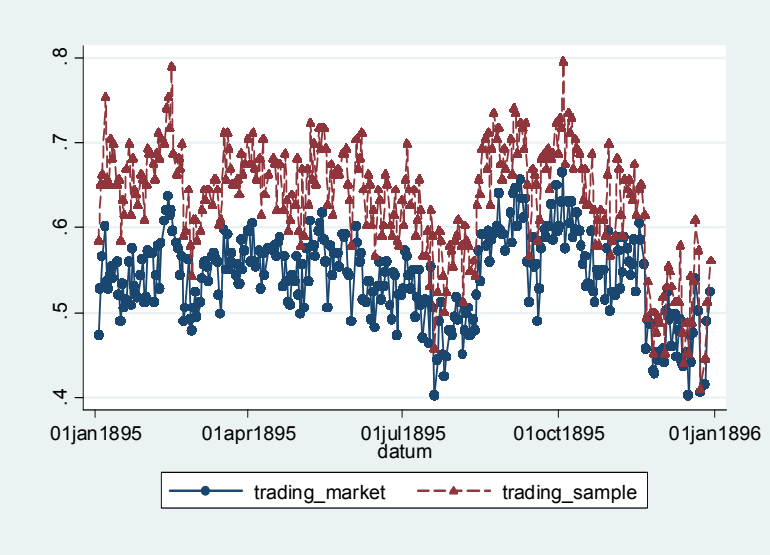
Variable	Value	Stock List Entry	Description
order_imbalance	-1.00	B	supply only
	-0.67	et bz B	some orders executed, but still a high level of supply left
	-0.33	bz B	some orders executed, but still supply left
	0.00	-- / bz	no quotation / all orders executed, no demand or supply left
	0.33	bz G	some orders executed, but still demand left
	0.67	et bz G	some orders executed, but still a high level of demand left
	1.00	G	demand only

Figure 1: Timeline



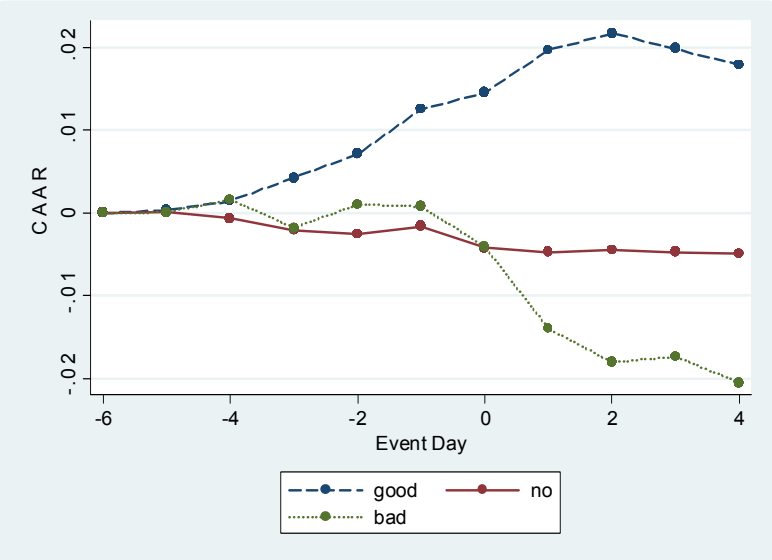
This figure shows the sequence of events between the dividend announcement and the official publication of the balance sheet and the income statement of publicly listed firms in Imperial Germany in 1895. The numbers of observations for each event are provided in parentheses. The number of firms in the population equals 311. The estimation window ranges from January 1, 1895, to the 31st day before the dividend announcement as well as from the 31st day after the official publication of the balance sheet and the income statement and December 31, 1895. If the date of the official publication of the balance sheet and income statement is not available, the second part of the estimation window ranges from the 101st day after the dividend announcement to December 31, 1895. The timeline is based on *Günther (2015)*.

Figure 2: Mean Trading in 1895



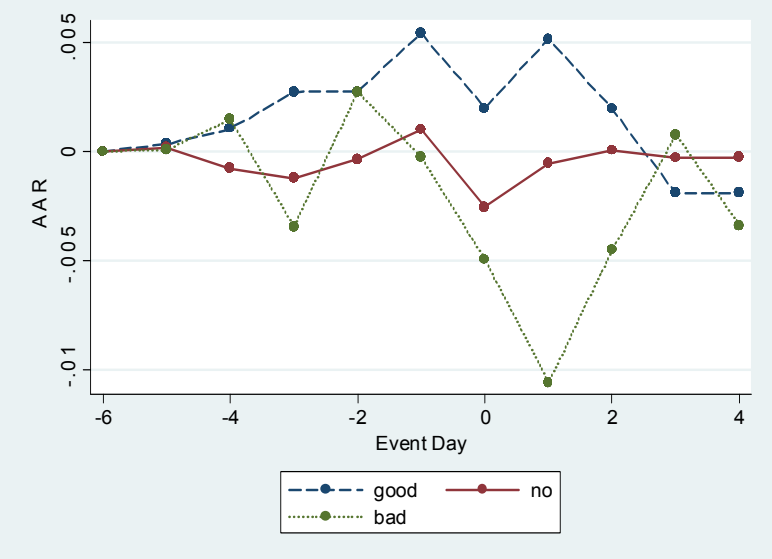
This figure shows the attributes of *trading_market* and *trading_sample* in 1895. *trading_market* is the mean of trading_*raw* on a given trading day. *trading_sample* is the mean of *trading_raw* of the dividend announcement sample (N=166) on a given trading day. *trading_raw* is as defined in Appendix C.

Figure 3: Market Model – Cumulative Abnormal Returns



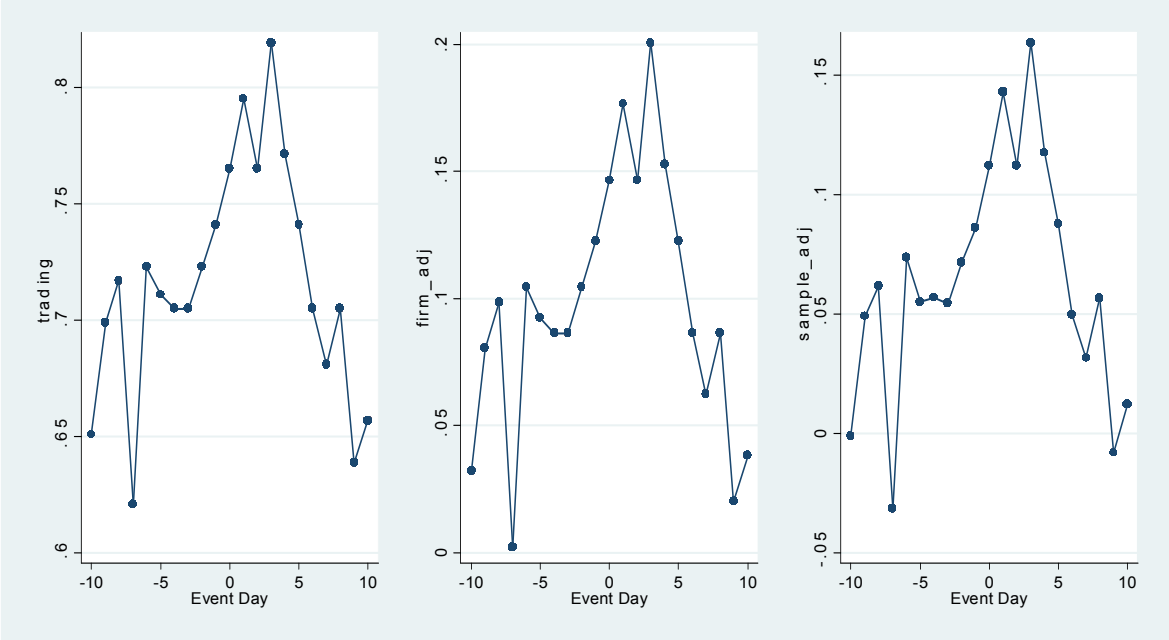
This figure shows market-adjusted cumulative average abnormal returns around dividend announcements of publicly listed firms in Imperial Germany in 1895. *good/no/bad* is the cumulative average abnormal return of firms announcing a dividend above/equal to/below the expected dividend.

Figure 4: Market Model – Abnormal Returns

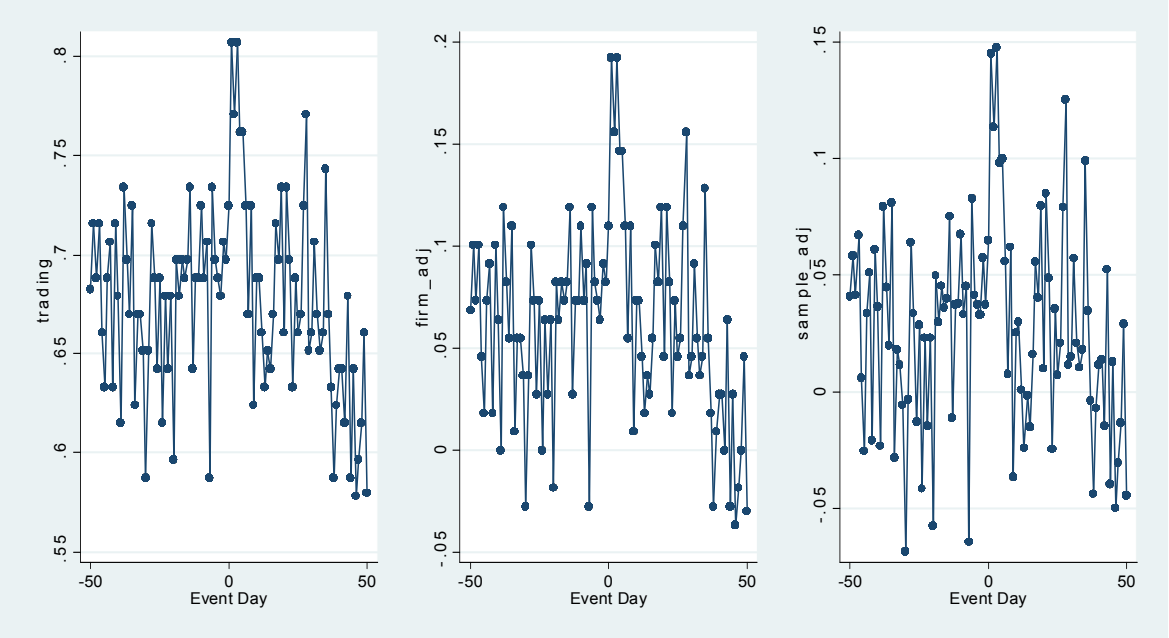


This figure shows market-adjusted average abnormal returns around dividend announcements of publicly listed firms in Imperial Germany in 1895. *good/no/bad* is the average abnormal return of firms announcing a dividend above/equal to/below the expected dividend.

Figure 5: Trading Effects
5a: Short Window [-10; 10]

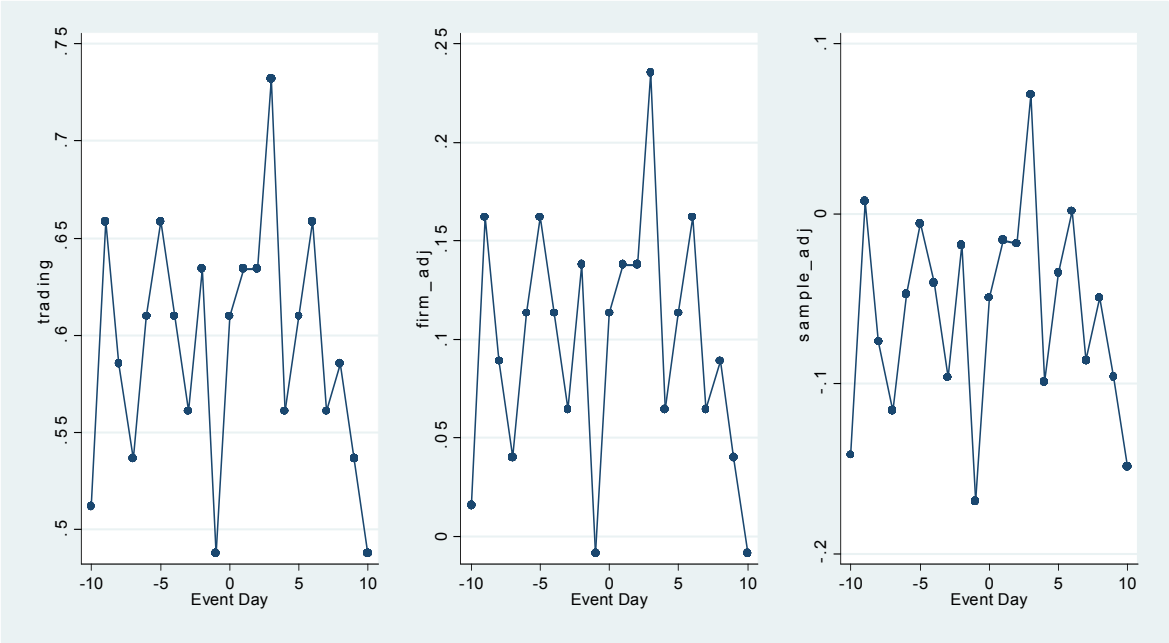


5b: Long Window [-50; 50]

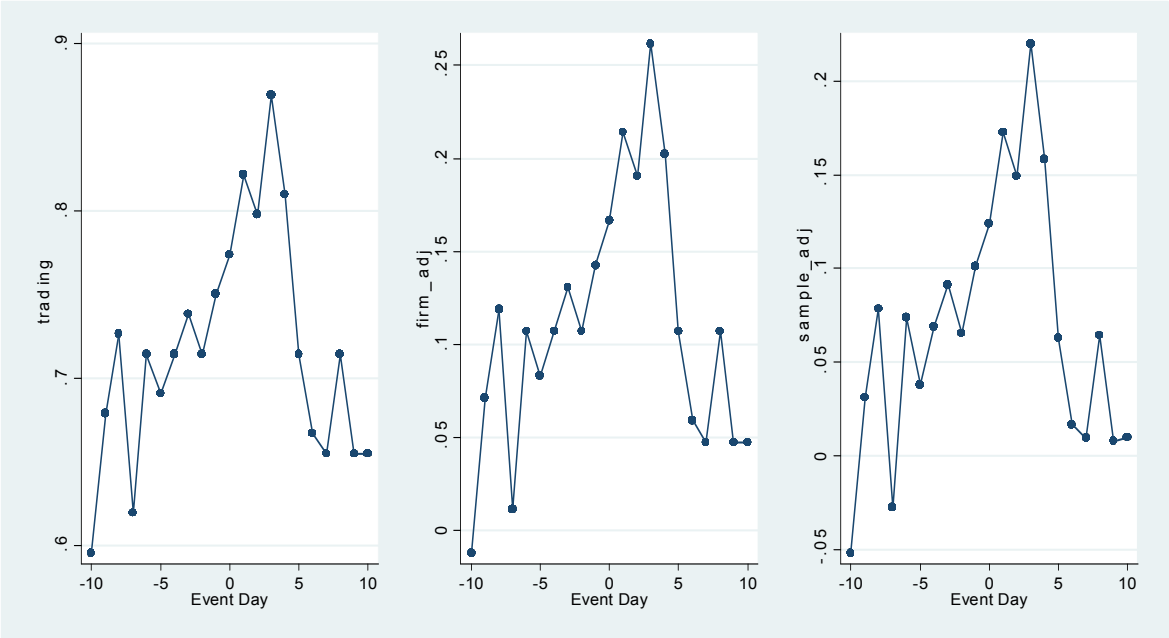


This figure shows the attributes of different trading proxies around dividend announcements of publicly listed firms in Imperial Germany in 1895. Figure 5a is based on the dividend announcement sample (N=166). Figure 5b is based on 109 firms out of the dividend announcement sample for which the full [-50, 50] event window is observable. *trading* is the mean of *trading_raw*. *sample_adj* is the mean of *trading_sample_adj*. *firm_adj* is the mean of *trading_firm_adj*. *trading_raw, trading_sample_adj*, and *trading_firm_adj* are as defined in Appendix C.

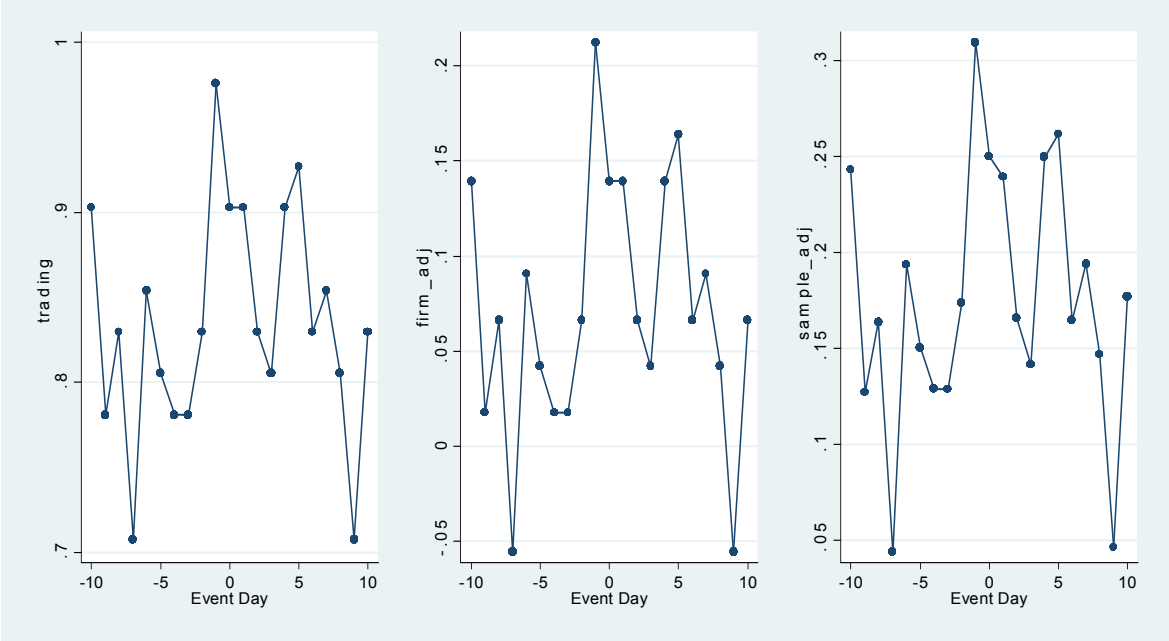
Figure 6: Short Window Trading Effects – Firm Size
6a: Small Sized Firms



6b: Medium Sized Firms

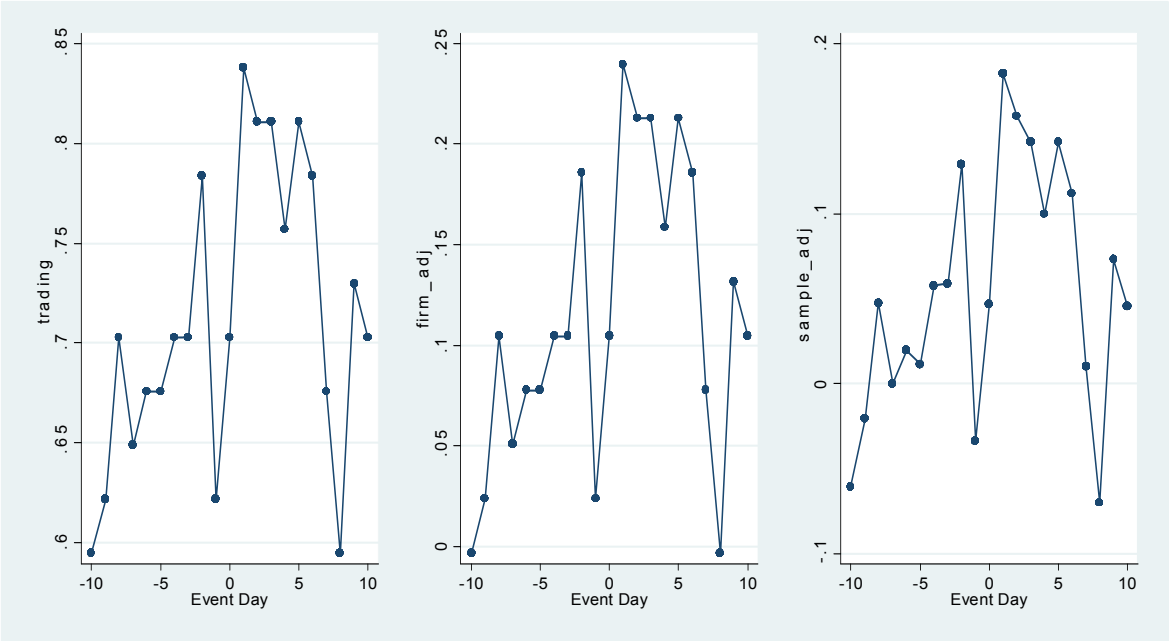


6c: Large Sized Firms

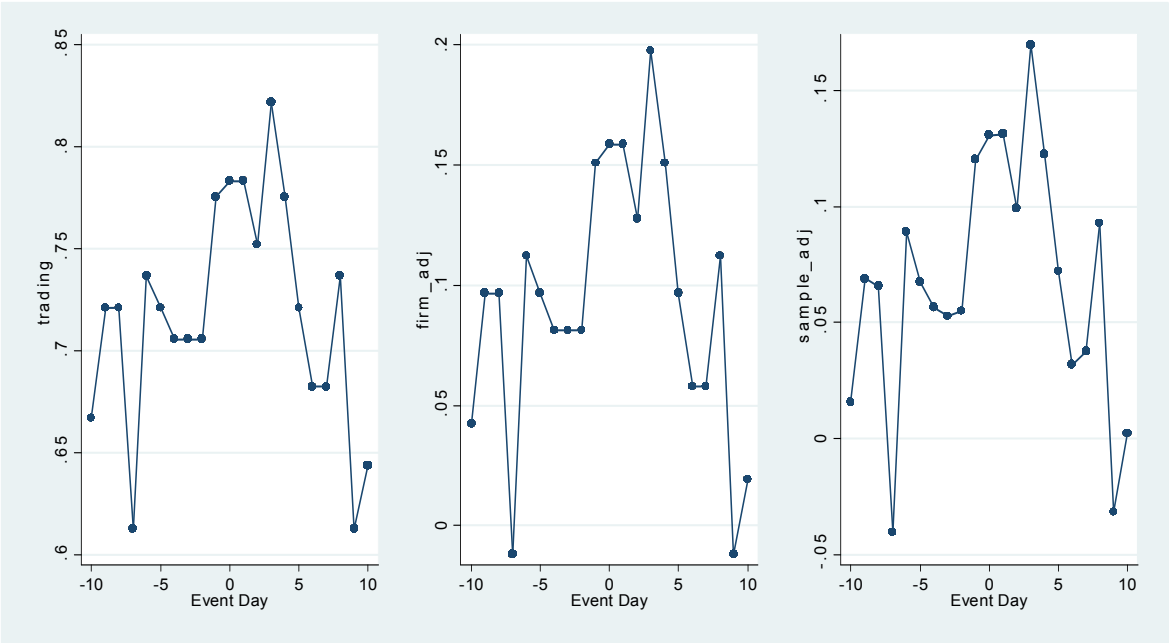


This figure shows the attributes of different trading proxies around dividend announcements of publicly listed firms in Imperial Germany in 1895. Small sized firms are firms with a *market_value* within the lower quartile. Medium sized firms are firms with a *market_value* within the interquartile range. Large sized firms are firms with a *market_value* within the upper quartile. *trading* is the mean of *trading_raw*. *sample_adj* is the mean of *trading_sample_adj*. *firm_adj* is the mean of *trading_firm_adj*. *trading_raw*, *trading_sample_adj*, and *trading_firm_adj* are as defined in Appendix C. *market_value* is a firm's market value at the beginning of 1895 and defined as book value of equity * first price quotation in 1895. The book value of equity is a firm's capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves.

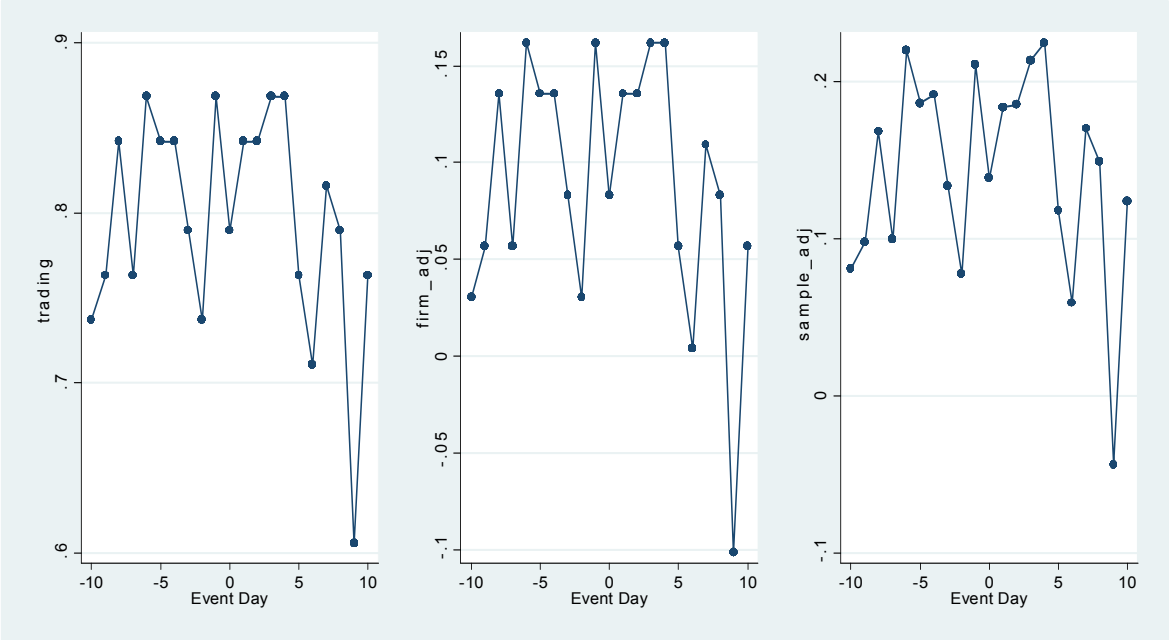
Figure 7: Short Window Trading Effects – Financial Reporting Transparency
7a: Low Financial Reporting Transparency



7b: Medium Financial Reporting Transparency

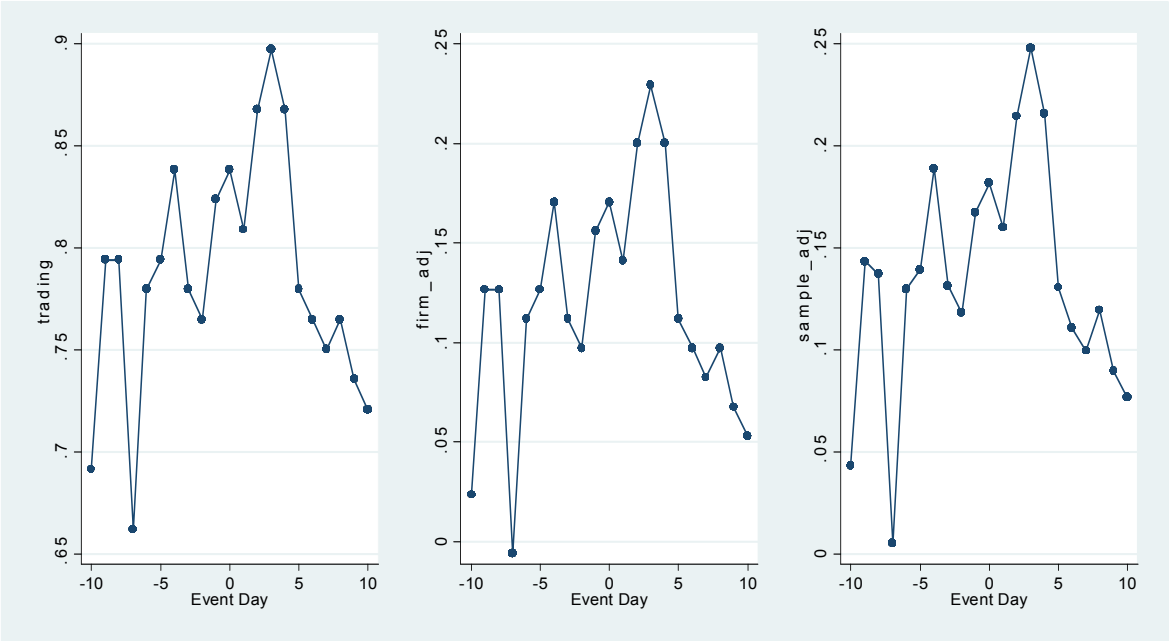


7c: High Financial Reporting Transparency

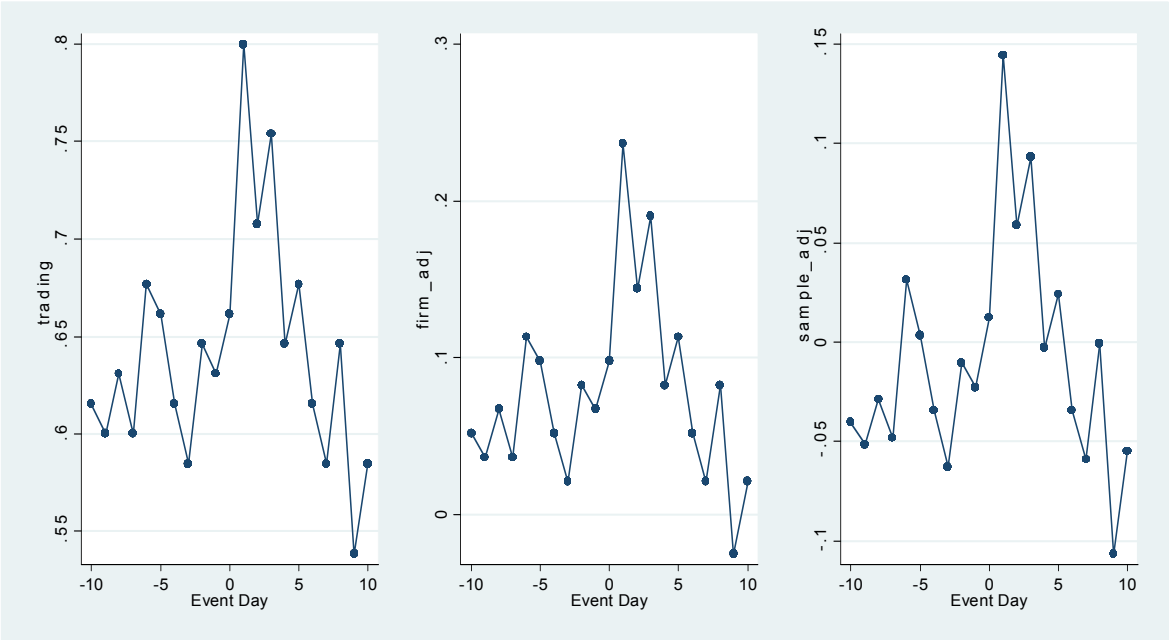


This figure shows the attributes of different trading proxies around dividend announcements of publicly listed firms in Imperial Germany in 1895. Firms exhibiting a low financial reporting transparency are firms with a *pos_reported* within the lower quartile. Firms exhibiting a medium financial reporting transparency are firms with a *pos_reported* within the interquartile range. Firms exhibiting a high financial reporting transparency are firms with a *pos_reported* within the upper quartile. *trading* is the mean of *trading_raw*. *sample_adj* is the mean of *trading_sample_adj*. *firm_adj* is the mean of *trading_firm_adj*. *trading_raw*, *trading_sample_adj*, and *trading_firm_adj* are as defined in Appendix C. *pos_reported* is the numbers of positions reported in a firm's financial statements (see *Günther 2015* for details).

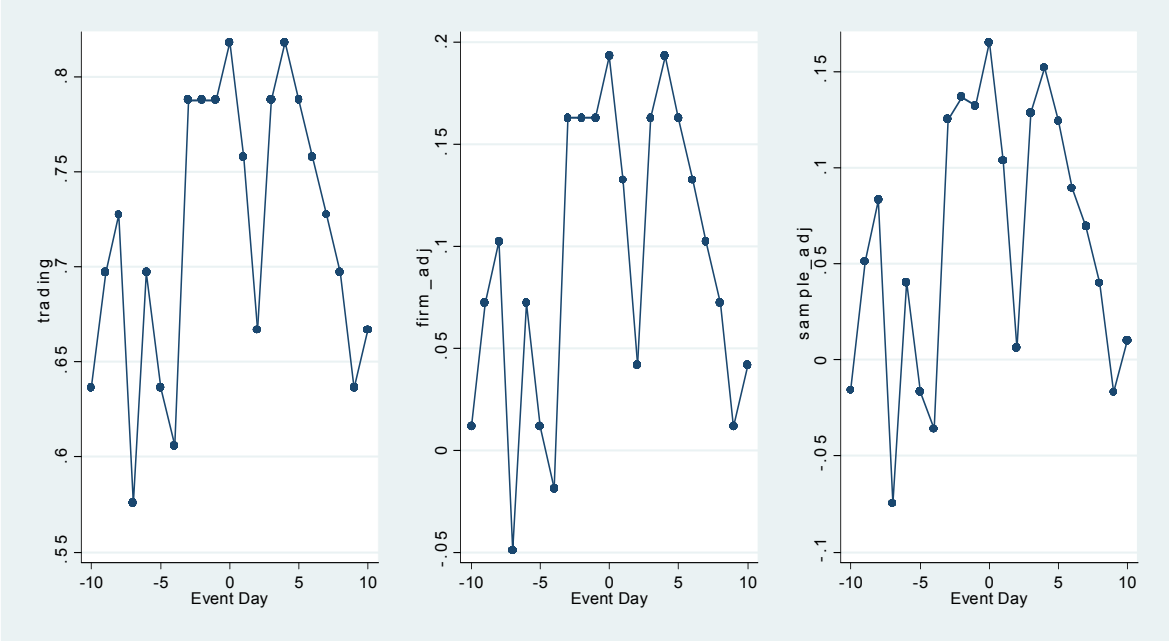
Figure 8: Short Window Trading Effects – Dividend Surprise
8a: Positive Dividend Surprise



8b: No Dividend Surprise

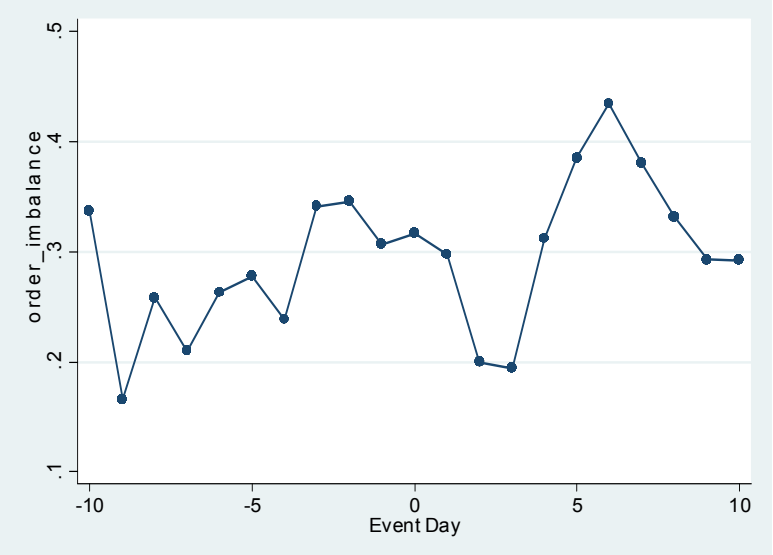


8c: Negative Dividend Surprise

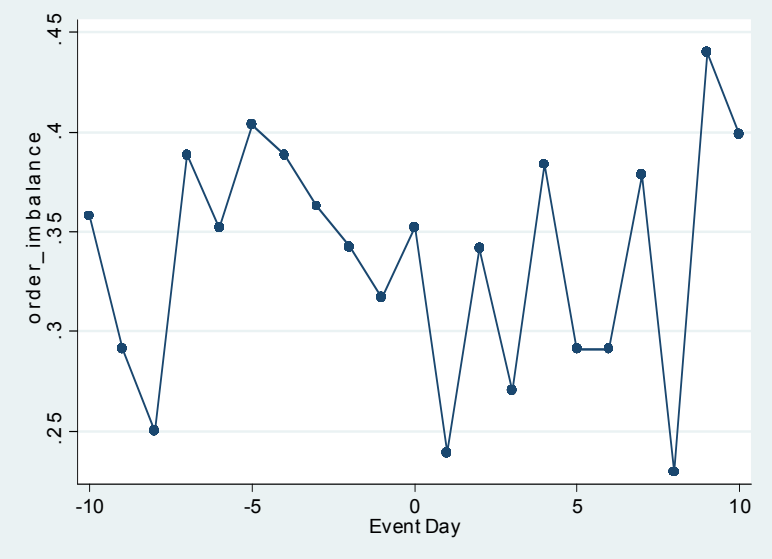


This figure shows the attributes of different trading proxies around dividend announcements of publicly listed firms in Imperial Germany in 1895. Firms announcing a positive/no/negative dividend surprise are firms announcing a dividend above/equal to/below the expected dividend. *trading* is the mean of *trading_raw*. *sample_adj* is the mean of *trading_sample_adj*. *firm_adj* is the mean of *trading_firm_adj*. *trading_raw*, *trading_sample_adj*, and *trading_firm_adj* are as defined in Appendix C.

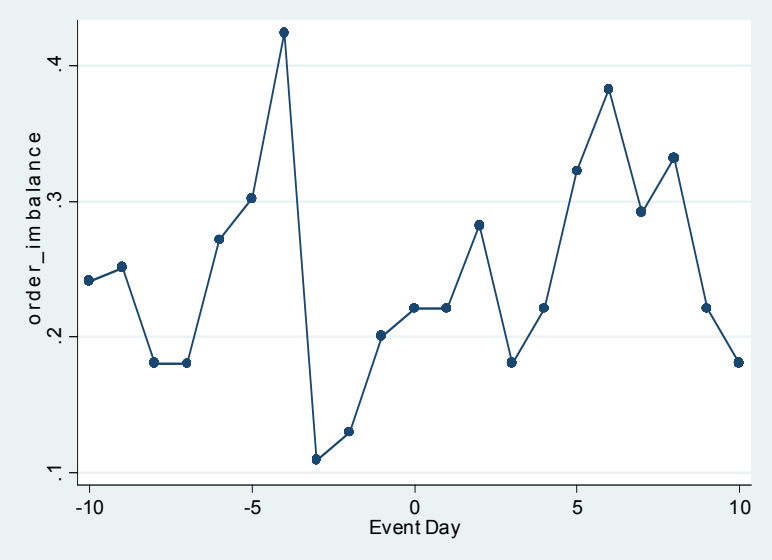
Figure 9: Order Imbalances
9a: Positive Dividend Surprise



9b: No Dividend Surprise

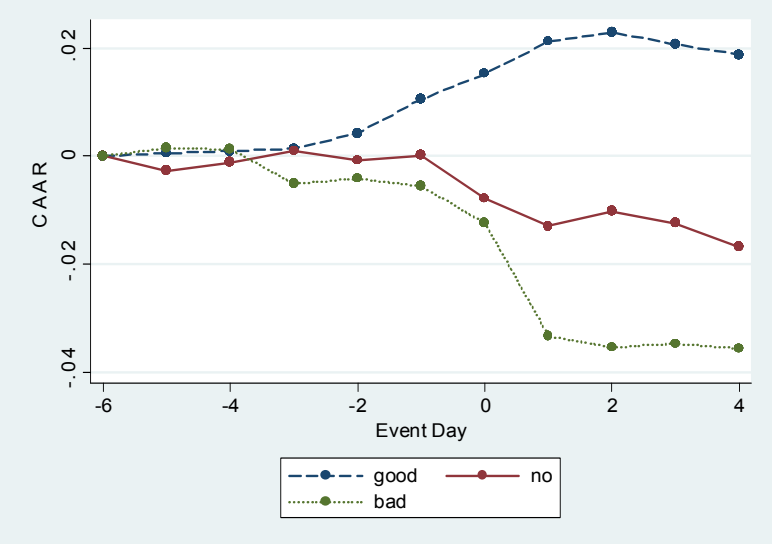


9c: Negative Dividend Surprise



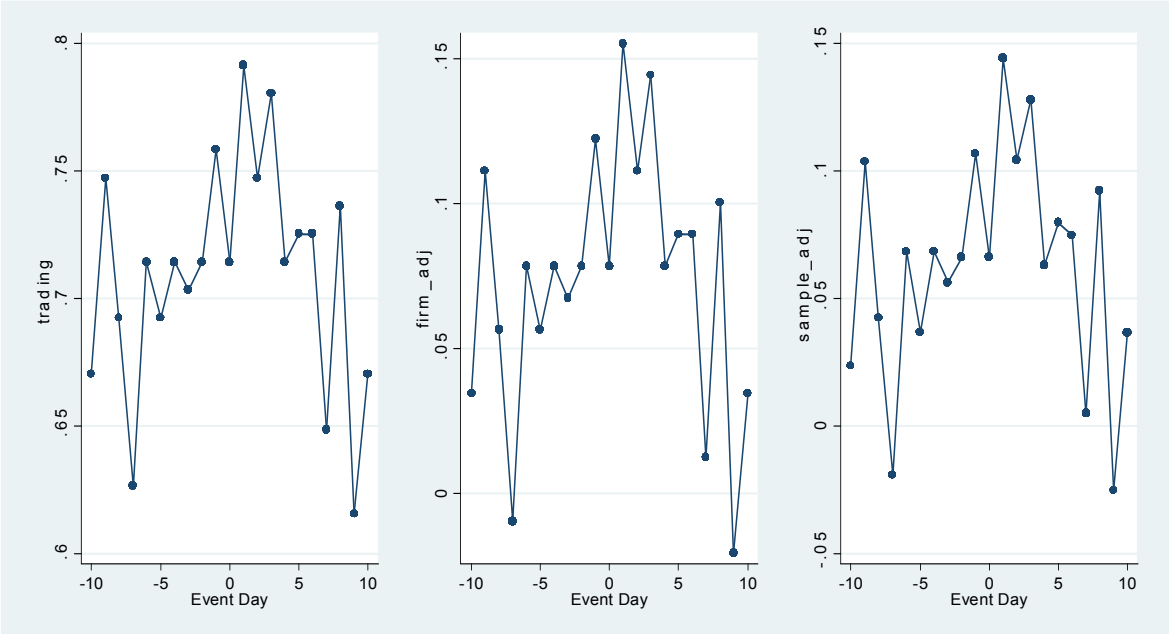
This figure shows the means of *order_imbalance* on a given event day around dividend announcements of publicly listed firms in Imperial Germany in 1895. Firms announcing a positive/no/negative dividend surprise are firms announcing a dividend above/equal to/below the expected dividend. *order_imbalance* is as defined in Appendix D.

Figure 10: Robustness Check – Exclusion of the Second Part of the Estimation Window

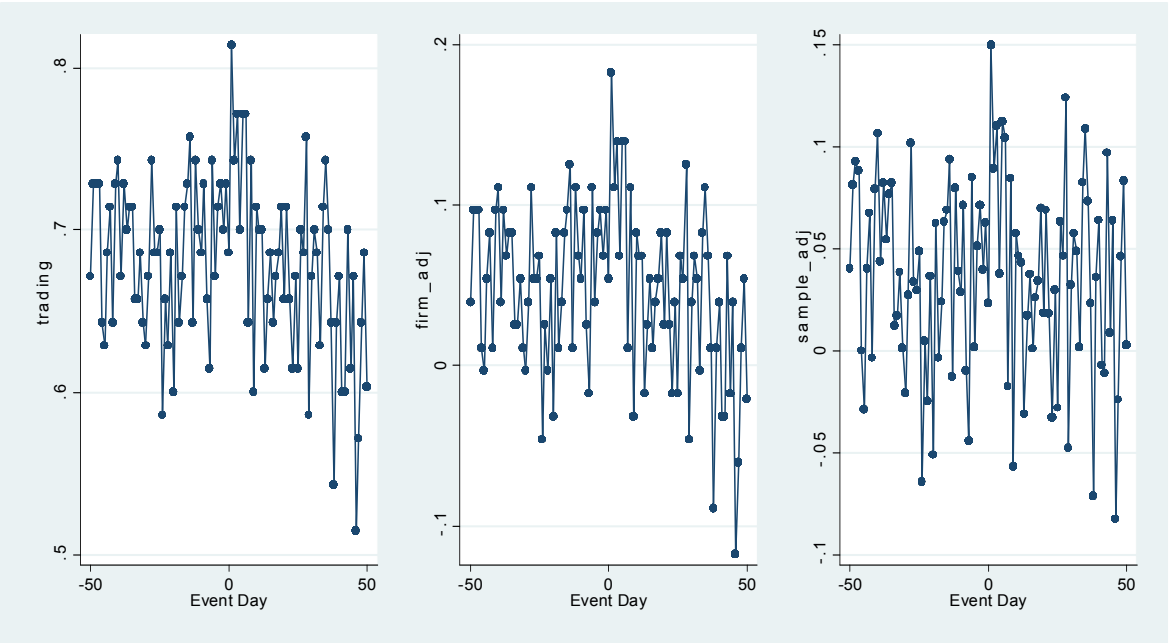


This figure shows market-adjusted cumulative average abnormal returns around dividend announcements of publicly listed firms in Imperial Germany in 1895. *good/no/bad* is the cumulative average abnormal return of firms announcing a dividend above/equal to/below the expected dividend. In contrast to figure 2, the second part of the estimation window (see figure 1) is excluded, which reduces the sample to 69 firms.

Figure 11: Robustness Check – Trading Effects without Firms Announcing a Dividend in Q1
11a: Short Window [-10; 10]



11b: Long Window [-50; 50]



This figure shows the attributes of different trading proxies around dividend announcements of publicly listed firms in Imperial Germany in 1895. In contrast to figure 5, firms announcing a dividend within the first quarter of 1895 are excluded. This reduces the sample to 91 firms (11a), respectively 70 firms (11b). *trading* is the mean of *trading_raw*. *sample_adj* is the mean of *trading_sample_adj*. *firm_adj* is the mean of *trading_firm_adj*. *trading_raw*, *trading_sample_adj*, and *trading_firm_adj* are as defined in Appendix C.

Table 1: Descriptive Statistics of the Timeline in 1895

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
FYE_Publication	202	100.1150	39.7034	30.0000	73.0000	92.5000	119.0000	303.0000
FYE_Meeting	261	100.8467	37.8440	23.0000	75.0000	95.0000	119.0000	302.0000
FYE_Dividend	264	69.2510	35.5971	9.0000	42.0000	64.0000	88.0000	269.0000
Dividend_Announce	215	4.4465	14.1608	-45.0000	0.0000	1.0000	6.0000	94.0000
Announce_Meeting	235	25.3660	7.0640	8.0000	21.0000	24.0000	29.0000	77.0000
Announce_BBZ	210	12.9619	8.3659	-7.0000	8.0000	12.0000	17.0000	46.0000
BBZ_Meeting	236	11.6229	7.2380	-7.0000	6.5000	12.0000	17.0000	34.0000
BBZ_Lines	255	75.4941	46.6253	16.0000	47.0000	66.0000	92.0000	420.0000
Meeting_Publication	195	2.7179	4.8734	0.0000	1.0000	2.0000	3.0000	49.0000

This table shows descriptive statistics of the dividend announcement, the official announcement of the annual shareholder meeting in the *'Berliner Börsen-Zeitung' (BBZ)*, the coverage of the annual reports by the *BBZ*, the annual shareholder meeting and the official publication of the balance sheet and the income statement of publicly listed firms in Imperial Germany for the year 1895. *FYE_Publication* is the time span between the fiscal year end and the official publication of the balance sheet and the income statement by a firm in the *BBZ* in days. *FYE_Meeting* is the time span between the fiscal year end and the annual shareholder meeting in days. *FYE_Dividend* is the time span between the fiscal year end and the dividend and earnings announcement in days. D*ividend_Announce* is the time span between the dividend and earnings announcement and the announcement of the annual shareholder meeting in the *BBZ* in days. *Announce_Meeting* is the time span between the announcement of the annual shareholder meeting in the *BBZ* and the annual shareholder meeting in days. *Announce_BBZ* is the time span between the announcement of the annual shareholder meeting in the *BBZ* and the coverage of the annual report by the *BBZ* in days. *BBZ_Meeting* is the time span between the coverage of the annual report by the *BBZ* and the annual shareholder meeting in days. *BBZ_Lines* is the extent of the coverage of the annual report by the *BBZ* in lines. *Meeting_Publication* is the time span between the annual shareholder meeting and the official publication of the balance sheet and income statement by a firm in the *BBZ*. The table is based on data from *Günther (2015)*.

Table 2: Sample Selection and Industry Classification

Panel A: Sample Selection

Industrial Corporations listed on the Berlin Stock Exchange in 1895	359
- Reduction to a single share type per firm	- 33
- Firms without a single price quotation within 1895	- 8
- Firms liquidated during 1895	- 7
= Population	**311**
- No data available on dividend (estimation)	- 9 (- 6)
- No dividend announcement date identified	- 34
- Missing data on earnings, total assets or equity	- 8
- No media coverage of the annual report by the *BBZ* identified	- 39
- Less than one week between dividend announcement and media coverage by *BBZ*	- 41
- Full event window not observable	- 2
- More than 50% of the days in estimation (event) window without price quotation	- 2 (- 4)
= Dividend Announcement Sample	**166**

Panel B: Industry Classification

	Industry Name	# Firms Population	# Firms Dividend Announcement Sample
1	Construction	25 (8.0%)	8 (4.8%)
2	Construction Materials	19 (6.1%)	11 (6.6%)
3	Electricity and Water Supply Works	11 (3.5%)	7 (4.2%)
4	Breweries	47 (15.1%)	24 (14.5%)
5	Chemical Factories	21 (6.8%)	12 (7.2%)
6	Engineering and Railroad Supply	42 (13.5%)	23 (13.9%)
7	Glass and Porcelain	6 (1.9%)	5 (3.0%)
8	Rubber	8 (2.6%)	6 (3.6%)
9	Metal	18 (5.8%)	9 (5.4%)
10	Mills	8 (2.6%)	5 (3.0%)
11	Paper and Carton	11 (3.5%)	7 (4.2%)
12	Water Transportation	8 (2.6%)	3 (1.8%)
13	Transportation	21 (6.8%)	10 (6.0%)
14	Clothes and Hats	7 (2.3%)	3 (1.8%)
15	Weaving and Spinning	23 (7.4%)	16 (9.6%)
16	Sugar Factories	7 (2.3%)	3 (1.8%)
17	Miscellaneous	29 (9.3%)	14 (8.4%)
		311	166

This table shows the sample selection procedure as well as the industry classification. The industry classification is in accordance with *'Saling's Börsenpapiere' Vol. 19 (1895/1896)*.

Table 3: Descriptive Statistics

Panel A: Summary Statistics - Firm-Level

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
market_value	166	7,398,593	12,157,941	196,554	2,119,205	3,620,807	7,374,371	88,910,856
tobins_q	166	1.4587	0.5389	0.2004	1.1438	1.3278	1.6879	4.6927
dividend	166	0.0773	0.1080	0.0000	0.0400	0.0600	0.1000	1.3000
dividend_surprise	166	0.0012	0.0214	-0.1200	0.0000	0.0000	0.0100	0.0600
earnings_surprise	166	0.0030	0.0420	-0.1899	-0.0076	0.0043	0.0144	0.2517
roa_{94}	166	0.0605	0.0652	-0.1222	0.0326	0.0545	0.0811	0.5838
pos_reported	166	34.7831	10.8784	14.0000	28.0000	32.0000	41.0000	78.0000
ind_5y_growth	17	0.0434	0.0223	0.0104	0.0286	0.0417	0.0548	0.0861

Panel B: Correlation Matrix - Firm Level

	market_ value	*tobins_ q*	*dividend*	*dividend_ surprise*	*earnings_ surprise*	roa_{94}	*pos_ reported*	*ind_5y_ growth*
market_value	X	**0.5149**	**0.4112**	-0.0403	-0.0969	**0.3047**	**0.1769**	0.1097
tobins_q	**0.4036**	X	**0.7953**	**0.1895**	0.1478	**0.7866**	-0.0920	0.0995
dividend	**0.2414**	**0.7375**	X	**0.3331**	**0.3067**	**0.8454**	-0.0733	0.0529
dividend_surprise	0.0230	0.0537	0.0931	X	**0.5994**	**0.2278**	0.0215	-0.1121
earnings_surprise	-0.0528	0.0888	0.0741	**0.5751**	X	**0.3573**	0.0304	**-0.2188**
roa_{94}	**0.2030**	**0.7848**	**0.8254**	**0.1542**	**0.3853**	X	**-0.1981**	0.0456
pos_reported	**0.2866**	-0.0656	-0.0361	-0.0102	-0.0235	**-0.1526**	X	-0.1497
ind_growth_5y	**0.1736**	0.1355	0.1338	-0.1262	-0.1954	0.0745	-0.0295	X

Panel C: Summary Statistics - Firm-Day Level of Population and Sample

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
Population								
daily_return	82313	0.0006	0.0121	-0.2693	-0.0026	0.0001	0.0036	0.3681
market_return	93922	0.0006	0.0029	-0.0269	-0.0002	0.0009	0.0022	0.0093
trading_raw	93922	0.5425	0.4982	0.0000	0.0000	1.0000	1.0000	1.0000
order_imbalance	93922	0.3067	0.5399	-1.0000	0.0000	0.3300	1.0000	1.0000
Sample								
daily_return	48599	0.0006	0.0121	-0.2693	-0.0028	0.0001	0.0037	0.3681
market_return	50132	0.0006	0.0029	-0.0269	-0.0002	0.0009	0.0022	0.0093
trading_raw	50132	0.6330	0.4820	0.0000	0.0000	1.0000	1.0000	1.0000
order_imbalance	50132	0.3157	0.5392	-1.0000	0.0000	0.3300	1.0000	1.0000

Panel D: Correlation Matrix - Firm-Day Level of Population

	daily_ return	*market_ return*	*trading_ raw*	*order_ imbalance*
daily_return	X	**0.1815**	**0.0520**	**0.0158**
market_return	**0.1719**	X	**0.0160**	0.0035
trading_raw	**0.0410**	0.0019	X	**-0.5036**
order_imbalance	-0.0003	**0.0106**	**-0.2227**	X

Panel E: Correlation Matrix - Firm-Day Level of Sample

	daily_ return	*market_ return*	*trading_ raw*	*order_ imbalance*
daily_return	X	**0.1930**	**0.0518**	**0.0178**
market_return	**0.1852**	X	**0.0171**	0.0063
trading_raw	**0.0415**	0.0068	X	**-0.4805**
order_imbalance	-0.0018	**0.0134**	**-0.2854**	X

Panel F: Summary Statistics - Firm-Day Level within [-5; 4] Event Window

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
daily_return	1633	0.0006	0.0144	-0.1218	-0.0041	0.0001	0.0058	0.1332
market_return	1660	0.0005	0.0033	-0.0269	-0.0001	0.0010	0.0021	0.0093
trading_raw	1660	0.7500	0.4331	0.0000	0.0000	1.0000	1.0000	1.0000
trading_sample_adj	1660	0.0971	0.4310	-0.7952	-0.1235	0.3193	0.3614	0.5482
trading_firm_adj	1660	0.1315	0.3936	-0.9553	-0.0462	0.2107	0.3908	0.9011
order_imbalance	1660	0.2946	0.4587	-1.0000	0.0000	0.3300	0.3300	1.0000

Panel G: Correlation Matrix - Firm-Day Level within [-5; 4] Event Window

	daily_ return	*market_ return*	*trading_ raw*	*trading_ sam-ple_adj*	*trading_ firm_adj*	*order_ imbalance*
daily_return	X	**0.1959**	0.0419	0.0386	0.0350	**0.0553**
market_return	**0.2216**	X	-0.0184	-0.0760	0.0016	0.0137
trading_raw	0.0370	-0.0107	X	**0.7375**	**0.7372**	**-0.4404**
trading_sample_adj	0.0371	-0.0129	**0.9930**	X	**0.5232**	**-0.3369**
trading_firm_adj	0.0397	0.0243	**0.8570**	**0.8498**	X	**-0.3557**
order_imbalance	0.0101	0.0117	**-0.3087**	**-0.3056**	**-0.2680**	X

This table shows descriptive statistics on the firm-level, on the firm-day level of the population, on the firm-day level of the dividend announcement sample, and on the firm-day level within the [-5, 4] event window around dividend announcements of publicly listed firms in Imperial Germany in 1895. Pearson correlation coefficients are presented below the diagonal and Spearman correlation coefficients are presented above the diagonal in panel B, D, E and G. Bold entries indicate significance at the 5% level or lower. *market_value* is a firm's market value at the beginning of 1895 and defined as book value of equity * first price quotation in 1895. The book value of equity is a firm's capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves. *tobins_q* is Tobin's Q and defined as (total assets – book value of equity + *market_value* – book value of listed bonds + market value of listed bonds) divided by total assets. A listed bond's market value is its face value * first price quotation in 1895. *dividend* is the announced dividend in 1895. *dividend_surprise* is the difference between *dividend* and the expected dividend. The expected dividend is the last dividend forecast of the *'Berliner Börsen-Zeitung' (BBZ)*. In case of a missing *BBZ* coverage the expected dividend is the estimated dividend announced by the commission of experts at the BSE at a firm's fiscal year end. In case of a missing dividend estimation of this commission the expected dividend is the dividend announced in 1894. *earnings_surprise* is the difference between the return on assets for the fiscal year starting in 1894 and the return on assets for the preceding fiscal year. roa_{94} is the return on assets and defined as net income over total assets for the fiscal year starting in 1894. *pos_reported* is the numbers of positions reported in a firm's financial statements (see *Günther 2015* for details). *ind_5y_growth* is the average industry-level growth of production between 1890 and 1895 as reported by *Hoffmann (1965)*. *daily_return* is defined as share price in t divided by share price in t-1. If the share is not quoted in t, *daily_return* is defined as share price in t+1 divided by share price in t-1. *market_return* is the average *daily_return* of an equally weighted portfolio of the 120 most often traded shares. *trading_raw, trading_sample_adj, trading_firm_adj* and *order_imbalance* are as defined in Appendix C and D.

Table 4: Share Price Effects – Event Study

Panel A: Event Study - Market Model

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
AR	1633	0.0001	0.0143	-0.1426	-0.0044	-0.0002	0.0049	0.1308
CAR	1660	0.0022	0.0323	-0.3398	-0.0079	0.0011	0.0144	0.1584

Event Day	Negative dividend surprise (33 firms)				No dividend surprise (65 firms)				Positive dividend surprise (68 firms)				
	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	t-value ($CAAR_{-5,t,neg} \neq CAAR_{-5,t,pos}$)
-5	0.0001	0.0340	0.0001	0.0340	0.0001	0.0663	0.0001	0.0663	0.0003	0.2666	0.0003	0.2666	-0.1072
-4	0.0015	0.9074	0.0015	0.6691	-0.0007	-0.3557	-0.0006	-0.3281	0.0010	0.7898	0.0013	0.7301	0.0781
-3	-0.0034	-1.1050	-0.0019	-0.4629	-0.0012	-0.7285	-0.0018	-0.6335	**0.0028***	**1.7409**	**0.0041***	**1.6918**	-1.3314
-2	0.0027	0.9162	0.0008	0.2972	-0.0004	-0.4119	-0.0022	-0.7389	**0.0027****	**1.8837**	**0.0068*****	**2.7665**	-1.4880
-1	-0.0003	-0.1415	0.0005	0.1549	0.0010	0.6233	-0.0012	-0.3200	**0.0054*****	**3.3253**	**0.0121*****	**4.1054**	**-2.3578****
0	**-0.0049***	**-1.9003**	-0.0044	-0.9408	-0.0025	-0.9396	-0.0037	-0.7586	0.0020	1.5416	**0.0141*****	**5.0214**	**-3.5749*****
1	**-0.0106****	**-2.1608**	**-0.0143***	**-1.9608**	-0.0005	-0.1543	-0.0042	-0.6883	**0.0051*****	**3.7981**	**0.0193*****	**6.1987**	**-4.9741*****
2	**-0.0045****	**-2.3068**	**-0.0185****	**-2.6359**	0.0000	0.0192	-0.0042	-0.7458	0.0019	1.5248	**0.0212*****	**6.1907**	**-5.7336*****
3	0.0007	0.3189	**-0.0178****	**-2.4431**	-0.0003	-0.1549	-0.0045	-0.7069	**-0.0019***	**-1.7276**	**0.0193*****	**5.7037**	**-5.2886*****
4	-0.0034	-1.5958	**-0.0210*****	**-2.7880**	-0.0003	-0.1625	-0.0047	-0.6957	**-0.0019****	**-2.0201**	**0.0174*****	**4.9011**	**-5.2577*****

Panel B: Event Study - Mean-Adjusted Return Model

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
AR	1633	0.0001	0.0144	-0.1253	-0.0046	-0.0002	0.0052	0.1313
CAR	1660	0.0018	0.0320	-0.3068	-0.0096	0.0000	0.0142	0.1584

Event Day	Negative dividend surprise (33 firms)				No dividend surprise (65 firms)				Positive dividend surprise (68 firms)				
	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	t-value ($CAAR_{-5,t,\,neg} \neq CAAR_{-5,t,\,pos}$)
-5	0.0003	0.1350	0.0003	0.1351	-0.0001	-0.0314	-0.0001	-0.0314	-0.0004	-0.3595	-0.0004	-0.3595	0.3167
-4	0.0014	0.8428	0.0017	0.7451	-0.0011	-0.5192	-0.0011	-0.5882	0.0008	0.6292	0.0005	0.2495	0.3973
-3	-0.0032	-1.0466	-0.0015	-0.3862	-0.0006	-0.3328	-0.0017	-0.5765	0.0017	0.9162	0.0021	0.7965	-0.7745
-2	0.0027	0.8656	0.0011	0.4275	-0.0002	-0.2095	-0.0019	-0.6262	0.0024	1.5840	**0.0046***	**1.7139**	-0.8173
-1	-0.0005	-0.2579	0.0006	0.1789	0.0009	0.6567	-0.0009	-0.2547	**0.0057*****	**3.5078**	**0.0103*****	**3.2104**	**-1.8688***
0	**-0.0050***	**-1.9001**	-0.0043	-0.9412	-0.0014	-0.5811	-0.0023	-0.5223	0.0014	1.0142	**0.0117*****	**3.7172**	**-2.8931*****
1	**-0.0100****	**-2.0693**	**-0.0138***	**-1.9400**	-0.0001	-0.0147	-0.0024	-0.4157	**0.0050*****	**3.4145**	**0.0167*****	**4.8707**	**-4.3739*****
2	**-0.0052****	**-2.5108**	**-0.0186****	**-2.6620**	0.0004	0.1906	-0.0020	-0.3741	0.0022	1.6013	**0.0188*****	**4.9499**	**-5.1215*****
3	0.0010	0.4241	**-0.0177****	**-2.3485**	-0.0002	-0.0999	-0.0022	-0.3600	**-0.0025***	**-1.9788**	**0.0164*****	**4.3239**	**-4.5138*****
4	-0.0033	-1.5840	**-0.0208****	**-2.6188**	-0.0006	-0.3636	-0.0028	-0.4174	-0.0015	-1.4464	**0.0149*****	**3.7963**	**-4.5258*****

Panel C: Event Study - Fama and French (1993) Three-Factor Model

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
AR	1633	0.0001	0.0139	-0.1270	-0.0046	-0.0001	0.0049	0.1108
CAR	1660	0.0021	0.0331	-0.3318	-0.0089	0.0006	0.0146	0.1522

Event Day	Negative dividend surprise (33 firms)				No dividend surprise (65 firms)				Positive dividend surprise (68 firms)				
	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	AAR_t	t-value ($AAR_t \neq 0$)	$CAAR_t$	t-value ($CAAR_{-5,t} \neq 0$)	t-value ($CAAR_{-5,t,\,neg} \neq CAAR_{-5,t,\,pos}$)
-5	0.0000	-0.0191	0.0000	-0.0191	-0.0011	-0.6012	-0.0011	-0.6013	0.0007	0.6014	0.0007	0.6014	-0.3431
-4	0.0016	1.0079	0.0016	0.6688	-0.0006	-0.2983	-0.0017	-0.6340	0.0011	0.8260	0.0018	0.9532	-0.0656
-3	-0.0037	-1.2342	-0.0022	-0.5245	-0.0008	-0.5295	-0.0025	-0.7073	**0.0027***	**1.7309**	**0.0045***	**1.8266**	-1.4617
-2	0.0025	0.8100	0.0003	0.0971	-0.0006	-0.6181	-0.0030	-0.8583	**0.0030****	**2.1115**	**0.0075*****	**2.9227**	**-1.7093***
-1	-0.0005	-0.2445	-0.0002	-0.0458	0.0011	0.6418	-0.0020	-0.4922	**0.0052*****	**3.1910**	**0.0126*****	**4.1202**	**-2.5015*****
0	**-0.0048***	**-1.8700**	-0.0050	-1.0377	-0.0025	-1.0163	-0.0045	-0.8791	**0.0023***	**1.7573**	**0.0149*****	**5.0783**	**-3.6958*****
1	**-0.0102****	**-2.0833**	**-0.0146****	**-1.9793**	-0.0006	-0.1776	-0.0050	-0.8284	**0.0050*****	**3.6284**	**0.0199*****	**6.0964**	**-4.9697*****
2	**-0.0044****	**-2.2060**	**-0.0187****	**-2.6403**	0.0005	0.2378	-0.0046	-0.8298	0.0018	1.4334	**0.0217*****	**6.0738**	**-5.6838*****
3	0.0000	0.0034	**-0.0187****	**-2.5636**	0.0002	0.1311	-0.0044	-0.7095	-0.0017	-1.4702	**0.0200*****	**5.4668**	**-5.3025*****
4	**-0.0036***	**-1.7400**	**-0.0221*****	**-2.9649**	-0.0010	-0.6852	-0.0053	-0.8217	**-0.0020****	**-2.0784**	**0.0181*****	**4.7425**	**-5.3320*****

This table shows share price effects around the dividend announcements of publicly listed firms in Imperial Germany in 1895. AR_t is the abnormal return at event day t. AAR_t is the average abnormal return at event day t. $CAR_{x,t}$ is the cumulative abnormal return between event day x and event day t. $CAAR_{x,t}$ is the cumulative average abnormal return between event day x and event day t. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level.

Table 5: Share Price Effects – Cross-Sectional OLS Analyses

Panel A: Dividend Irrelevance Hypothesis

Dependent Variable	*(1)* *CAR-5,4*	*(2)* *daily_return*
constant	-0.0456 (0.0821)	**0.0036***** **(0.0010)**
dividend_surprise	**0.6986**** **(0.3270)**	-0.0019 (0.0044)
earnings_surprise	0.1630 (0.3114)	0.0045 (0.0035)
event_window	-	-0.0002 (0.0004)
*event_window * dividend_surprise*	-	**0.0733**** **(0.0311)**
*event_window * earnings_surprise*	-	0.0054 (0.0230)
ln_market_value	0.0041 (0.0057)	**-0.0002***** **(0.0001)**
tobins_q	0.0022 (0.0081)	0.0002 (0.0002)
beta	-	0.0001 (0.0001)
trading_sample_adj	-	**0.0011***** **(0.0001)**
Fixed Effects	Industry	Industry
Adjusted R^2	0.1429	0.0026
N	166	48599

Panel B: Signaling Hypothesis vs. Free Cash Flow Hypothesis I

Dependent Variable	*(1)* *CAR-5,4*	*(2)* *CAR-5,4*	*(3)* *CAR-5,4*	*(4)* *CAR-5,4*	*(5)* *CAR-5,4*
constant	0.0194 (0.0119)	0.0167 (0.0118)	0.0139 (0.0112)	0.0250 (0.0156)	0.0151 (0.0113)
dividend_surprise	**1.6841***** **(0.3104)**	**1.5158***** **(0.3456)**	**0.9383***** **(0.3455)**	**0.9071***** **(0.1984)**	**1.9039***** **(0.4433)**
large_pos_reported	-0.0070 (0.0087)	-0.0064 (0.0086)	-	-	-0.0066 (0.0086)
large_ind_5y_growth	-0.0158 (0.0145)	-	-0.0118 (0.0146)	-	-0.0161 (0.0141)
large_ln_market_value	-	-	0.0077 (0.0076)	0.0037 (0.0062)	0.0086 (0.0073)
large_tobins_q	-	0.0083 (0.0075)	-	0.0094 (0.0070)	0.0056 (0.0069)
*dividend_surprise * large_pos_reported*	**-0.8373***** **(0.3056)**	**-0.6737**** **(0.3255)**	-	-	**-0.9061**** **(0.3490)**
*dividend_surprise * large_ind_5y_growth*	-0.3690 (0.2610)	-	-0.2449 (0.3587)	-	-0.4413 (0.3308)
*dividend_surprise * large_ln_market_value*	-	-	0.0951 (0.3232)	0.2816 (0.2889)	0.2323 (0.3238)
*dividend_surprise * large_tobins_q*	-	-0.2615 (0.2689)	-	-0.3732 (0.3167)	-0.4283 (0.2755)
Fixed Effects	Industry	Industry	Industry	Industry	Industry
Adjusted R^2	0.1534	0.1512	0.1295	0.1552	0.1537
N	166	166	166	166	166

Panel C: Signaling Hypothesis vs. Free Cash Flow Hypothesis II

Dependent Variable	*(1)* *ABSCAR$_{-5,4}$*	*(2)* *ABSCAR$_{-5,4}$*	*(3)* *ABSCAR$_{-5,4}$*	*(4)* *ABSCAR$_{-5,4}$*	*(5)* *ABSCAR$_{-5,4}$*
constant	**0.0395**** **(0.0165)**	0.0250 (0.0156)	**0.1692***** **(0.0557)**	**0.1649***** **(0.0606)**	**0.1727***** **(0.0587)**
| *dividend_surprise* |	**0.4382**** **(0.1805)**	**0.4128**** **(0.1833)**	**0.4012**** **(0.1933)**	**0.4031**** **(0.1942)**	**0.3865*** **(0.1982)**
pos_reported	-0.0002 (0.0002)	-0.0001 (0.0002)	-	-	0.0002 (0.0003)
ind_5y_growth	-	0.0928 (0.3853)	-	0.1398 (0.4046)	0.1243 (0.4179)
ln_market_value	-	-	**-0.0102***** **(0.0037)**	**-0.0099**** **(0.0040)**	**-0.0110**** **(0.0042)**
tobins_q	-0.0096 (0.0082)	-	0.0009 (0.0063)	-	0.0022 (0.0065)
Fixed Effects	Industry	Industry	Industry	Industry	Industry
Adjusted R^2	0.0042	0.0089	0.0569	0.0632	0.0522
N	166	166	166	166	166

This table shows results of regression analyses of share price effects around dividend announcements of publicly listed firms in Imperial Germany in 1895. $CAR_{x,t}$ is the market-adjusted cumulative abnormal return between event day x and event day t. $ABSCAR_{x,t}$ is the market-adjusted absolute cumulative abnormal return between event day x and event day t. *daily_return* is defined as share price in t divided by share price in t-1. If the share is not quoted in t, *daily_return* is defined as share price in t+1 divided by share price in t-1. *ln_market_value* is the natural logarithm of a firm's market value at the beginning of 1895 and defined as book value of equity * first price quotation in 1895. The book value of equity is a firm's capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves. *tobins_q* is Tobin's Q and defined as (total assets – book value of equity + *market_value* – book value of listed bonds + market value of listed bonds) divided by total assets. A listed bond's market value is its face value * first price quotation in 1895. *pos_reported* is the numbers of positions reported in a firm's financial statements (see *Günther 2015* for details). *ind_5y_growth* is the average industry-level growth of production between 1890 and 1895 as reported by *Hoffmann (1965)*. *large_ln_market_value (large_tobins_q) (large_ind_5y_growth) (large_pos_reported)* is a binary dummy variable that equals 1, if the firm's *market_value (tobins_q) (ind_5y_growth) (pos_reported)* is equal to or above the median of the distribution and 0 otherwise. *dividend* is the announced dividend in 1895. *dividend_surprise* is the difference between *dividend* and the expected dividend. The expected dividend is the last dividend forecast of the *'Berliner Börsen-Zeitung' (BBZ)*. In case of a missing *BBZ* coverage the expected dividend is the estimated dividend announced by the commission of experts at the BSE at a firm's fiscal year end. In case of a missing dividend estimation by this commission the expected dividend is the dividend announced in 1894. *earnings_surprise* is the difference between the return on assets (net income over total assets) for the fiscal year starting in 1894 and the return on assets for the preceding fiscal year. *event_window* is a binary dummy variable that equals 1, if a trading day lies within the [-5, 4] event window around the dividend announcement and 0 otherwise. *beta* is the beta factor of a share against the market portfolio. The market portfolio contains the 120 most often traded shares. *trading_sample_adj* is as defined in Appendix C. All models except model (2) in panel A employ robust standard errors, which are provided in parentheses. In model (2) of panel A, standard errors are clustered at the firm-level and provided in parentheses. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level.

Table 6: Trading Effects

	Logit	*OLS*									
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*
Dependent Variable	*trading_ raw*	*trading_ sam-ple_adj*	*trading_ firm_adj-10,10*	*trading_ firm_adj-10,10*	*trading_ firm_adj-10,10*	*trading_ firm_adj-10,-1*	*trading_ firm_adj-10,-1*	*trading_ firm_adj-10,-1*	*trading_ firm_adj1,10*	*trading_ firm_adj1,10*	*trading_ firm_adj1,10*
constant	**-10.5918*** (1.1197)**	**-1.7226*** (0.2134)**	**-0.3951*** (0.1288)**	**-0.5629*** (0.0972)**	**-0.3931*** (0.1294)**	**-0.5023*** (0.1813)**	**-0.5630*** (0.1460)**	**-0.4879*** (0.1831)**	-0.2444 (0.1906)	**-0.5377*** (0.1384)**	-0.2527 (0.1914)
dividend_surprise	0.0011 (0.0297)	-0.0008 (0.0064)	**0.0157*** (0.0032)**	**0.0157*** (0.0032)**	**0.0158*** (0.0032)**	**0.0133*** (0.0048)**	**0.0135*** (0.0047)**	**0.0135*** (0.0047)**	**0.0181*** (0.0045)**	**0.0179*** (0.0045)**	**0.0180*** (0.0045)**
earnings_surprise	**2.6731* (1.4912)**	**0.6088* (0.3228)**	-	-	-	-	-	-	-	-	-
event_window	**0.5196*** (0.0800)**	**0.0983*** (0.0144)**	-	-	-	-	-	-	-	-	-
dividend_surprise event_window*	**0.0974** (0.0461)**	**0.0187** (0.0089)**	-	-	-	-	-	-	-	-	-
earnings_surprise event_window*	0.0394 (2.4893)	-0.0627 (0.4401)	-	-	-	-	-	-	-	-	-
ln_market_value	**0.5207*** (0.0726)**	**0.1072*** (0.0139)**	**-0.0127* (0.0069)**	-	**-0.0132* (0.0073)**	-0.0028 (0.0100)	-	-0.0060 (0.0106)	**-0.0246** (0.0099)**	-	**-0.0217** (0.0106)**
pos_reported	-	-	-	-0.0001 (0.0007)	-0.0002 (0.0007)	-	0.0012 (0.0010)	0.0013 (0.0011)	-	**-0.0017* (0.0010)**	-0.0011 (0.0010)
trading_sample	**4.5563*** (0.2630)**	-	**0.9096*** (0.1369)**	**0.8888*** (0.1363)**	**0.9080*** (0.1371)**	**0.8109*** (0.2078)**	**0.7837*** (0.2055)**	**0.7962*** (0.2088)**	**0.9635*** (0.1946)**	**0.9473*** (0.1953)**	**0.9681*** (0.1948)**
Fixed Effects	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Pseudo R^2 / Adjusted R^2	0.0713	0.0710	0.0578	0.0570	0.0575	0.0425	0.0432	0.0428	0.0762	0.0779	0.0780
N	50132	50132	3486	3486	3486	1660	1660	1660	1660	1660	1660

This table shows the results of cross-sectional regression analyses investigating trading effects around dividend announcements of publicly listed firms in Imperial Germany in 1895. *trading_raw*, *trading_sample_adj* and *trading_firm_adj* are as defined in Appendix C. $trading\_firm\_adj_{t,x}$ is *trading_firm_adj* in the [t, x] window around the dividend announcement. *ln_market_value* is the natural logarithm of a firm's market value at the beginning of 1895 and defined as book value of equity * first price quotation in 1895. The book value of equity is a firm's capital stock + mandatory reserves according to Par. 185b, 239b ADHGB + voluntary reserves. *pos_reported* is the numbers of positions reported in a firm's financial statements (see *Günther 2015* for details). *dividend* is the announced dividend in 1895. *dividend_surprise* is the difference between *dividend* and the expected dividend. The expected dividend is the last dividend forecast of the *'Berliner Börsen-Zeitung' (BBZ)*. In case of a missing *BBZ* coverage the expected dividend is the estimated dividend announced by the commission of experts at the BSE at a firm's fiscal year end. In case of a missing dividend estimation by this commission the expected dividend is the dividend announced in 1894. *earnings_surprise* is the difference between the return on assets (net income over total assets) for the fiscal year starting in 1894 and the return on assets for the preceding fiscal year. *event_window* is a binary dummy variable that equals 1, if a trading day lies within the [-5, 4] event window around the dividend announcement and 0 otherwise. *trading_sample* is the mean of *trading_raw* of the dividend announcement sample on a given trading day. Standard errors are clustered at the firm-level in model (1) and (2) and provided in parentheses. Models (3) - (11) employ robust standard errors, which are provided in parentheses. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level.

Bank-Dominated Supervisory Boards and Earnings Management
An Analysis of German Firms before World War I

Abstract

This paper analyzes the earnings of 50 public and 50 private German firms for the fiscal years 1903-1907. I find the earnings kinks reported by *Burgstahler and Dichev (1997)*. I also find that these kinks disappear once I adjust earnings for depreciations. This is indicative of earnings being managed. However, my analyses do not support a divergent probability to avoid small losses and earnings decreases when firms are monitored by bank directors. Based on a propensity score matching I do also not find systematic differences in discretionary depreciations between firms monitored by bank directors and firms without such bank attachments in general. My results indicate that financial expertise does not ipso facto increase a board's monitoring quality. This holds for both, public and private firms. My findings add to the regulatory debate on desirable board compositions, to the historical accounting and finance literature, and to research on the interplay between corporate governance attributes and earnings management.

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1 Introduction

Recent regulatory interventions in the field of corporate governance increasingly emphasize the importance of financial experts sitting on corporate boards. The last major revision of the German law on stock corporations for example obliges publicly listed firms to feature at least one independent supervisory board member exhibiting a professional background in accounting or auditing (*Par. 100.5 AktG*). A rationale for the tendency to increase the financial expertise on supervisory boards is that board members with a professional background in the financial industries or an auditing firm are supposed to have a more comprehensive skill set to identify opportunistic financial reporting. This in turn is supposed to enhance the board's monitoring quality. However, empirical evidence on the validity of this assumption is mixed (e.g. *Klein 2002; Xie et al. 2003; Park and Shin 2004; Garcia Osma and Gill-de-Albornoz Noguer 2007*; *Jaggi et al. 2009; Armstrong et al. 2010*). In this respect, *Brown et al. (2011)* stress the importance to consider the institutional context in which boards are operating.

I transfer the research question to Imperial Germany in the 1900s since the institutional context at this time offers two unique features which are less pronounced in modern settings. First, the financial reporting regulation is extremely principle based (*Hoffmann and Detzen 2013*). Hence, supervisory boards are truly challenged by the shape of the GAAP (*Kothari et al. 2010*). Second, external auditing is not mandatory and voluntary audits are of low quality (*Evans 2003*). Hence, monitoring by supervisory boards is a more important limit to earnings management than nowadays. Moreover, many supervisory boards exhibit a considerable proportion of financial experts, i.e. bank directors (*Fohlin 2007*). Hence, I am able to analyze the association between financial experts on supervisory boards and earnings management in a setting that does not exogenously impose certain board compositions. However, while the setting entails these prominent differences to modern settings, prior historical literature does not provide sufficient guidance on the

expected association between the presence of bank directors on supervisory boards and earnings management. While the rationale of an increased monitoring quality induced by the bank directors' financial expertise might hold, prior historical studies also offer indications for supervisory board members collaborating with the management (*Pohl 1981*) and supervisory boards being an ineffective monitoring device (*Horn 1979*). Therefore, I primarily analyze whether bank affiliated supervisory board members are associated with earnings management at all, whilst I do not presume a clear effective direction.

In order to analyze my research question, I hand-collect firm-level data for 50 private and 50 public German firms for the fiscal years 1903-1907. I analyze both, the supervisory boards and the reported earnings of these firms. First, I confirm prior literature (e.g. *Fohlin 2007*) by showing evidence consistent with a substantial presence of bank directors on supervisory boards. Second, I find the earnings kinks reported by *Burgstahler and Dichev (1997)*. Moreover, I find that these kinks disappear once I adjust earnings for depreciations. Since depreciations are the major accrual component in this setting, my finding is consistent with earnings being managed. However, I do not find a statistically significant association between the tendency to avoid small losses or earnings decreases and bank directors taking the position of the chairman or the deputy chairman.[43] Moreover, based on a propensity score matching, I do also not find statistically significant associations between bank-dominated supervisory boards and the level of discretionary depreciations in general.[44] This is also supported by two stages least squares regressions employing the distance between a firm's headquarter and the financial centre of Imperial Germany, i.e. Berlin, as an instrumental variable. Taken together, I find evidence consistent with supervisory boards being dominated by banks and earnings being managed. However, I do not find evidence con-

[43] I follow *Fohlin (2007)* who assumes that these positions are more important than normal board positions and hence reflect the dominance of banks on supervisory boards.

[44] Discretionary depreciations are the residual of an accrual model describing depreciations as a function of property, plant, and equipment.

sistent with earnings management being associated with bank-dominated supervisory boards neither for public nor for private firms.

These results add to the historical accounting and finance literature as well as to research on the interplay of board compositions and earnings management. First, prior historical literature is inconclusive about the actual influence of bank affiliated supervisory board members on German firms before World War I. While it is widely accepted that bank directors were commonly present on supervisory boards (e.g. *Burhop 2006a*; *Fohlin 2007*), it remains an open question whether these bank attachments actually evolved an influence (e.g. *Guinnane 2002*). The results of this study support the perspective of *Fohlin (1998)* that bank affiliated supervisory board members did not exhibit an influence on the supervised firms in Imperial Germany. Financial reporting is a major firm-level information device and if bank directors had an influence on the firms, I would likely observe systematic differences in earnings management between firms monitored by a bank-dominated supervisory board and firms without such bank attachments. Secondly, this study adds to the historical accounting literature by showing large scale evidence consistent with earnings of firms in Imperial Germany being managed. Prior literature in this area, in contrast, is focusing on small samples and/or disclosure choices (e.g. *Westermann 1966*; *Günther 2015a*). Thirdly, this study adds to research on the association between the level of financial expertise present on corporate boards and earnings management (e.g. *Brown et al. 2011*). My results support the notion that monitoring by financial experts does not necessarily limit aggressive reporting techniques. This also translates into regulatory discussions on desirable board compositions. My results show that a board's monitoring quality is not ipso facto increased by enforcing a certain board composition. This supports the argument that the board's quality determines how well the monitoring function is performed and not a specific proportion of independent financial experts (e.g. *Sarkar et al. 2008)*.

The remainder of the paper is organized as follows. Section 2 outlines the institutional background, shows how this study contributes to prior literature, and develops expectations on the association between bank-dominated supervisory boards and earnings management. Section 3 encompasses the empirical analyses. Section 4 concludes.

2 Institutional Background and Literature Review

2.1 The German Corporate Governance System before World War I

The modern German corporate governance system follows a two-tier structure allocating the executive power to a management committee while allocating the monitoring of this committee to a supervisory board. This system roots in the first draft of the German Commercial Code in 1861 which initially suggested a voluntary two-tier structure (*Franks et al. 2006*). Subsequent changes of the German Commercial Code in 1870 and especially in 1884 increasingly emphasized the monitoring role of the meanwhile mandatory supervisory board. This also holds for the revised German Commercial Code (*HGB*) which became effective on January 1, 1900. According to *Par. 231 HGB* the management committee was designated to represent the corporation.[45] Moreover, the management committee was responsible for keeping accounts (*Par. 239 HGB*) and obliged to prepare an annual report (*Par. 260 HGB). Par. 246 HGB*, in contrast, stipulated a supervisory board monitoring the management committee.[46] This also involved an audit of the annual report.[47] The monitoring role of the supervisory board was stressed throughout the *HGB*. *Par. 248 HGB* e.g. interdicted that a member of the supervisory board was concurrently a member of the management committee.[48] *Par. 248 HGB* also interdicted that a member of the management

[45] The management committee could only comprise a CEO. More members were possible (*Par. 231 HGB*).
[46] The supervisory board had to be at least constituted of three members (*Par. 243 HGB*).
[47] External audits were not mandatory. Voluntary audits were perceived to be of low quality (*Evans 2003*).
[48] A supervisory board member was allowed to deputize a member of the management committee occasionally. However, this member could not participate in the decisions of the supervisory board in the meantime.

committee could become a member of the supervisory board before the formal approval of the actions by the annual shareholder meeting.

However, prior literature shows that members of supervisory boards were sometimes engaged into managing activities and that the regulatory intended division of tasks was not always strictly implemented (*Pohl 1981*). In this context, the influence of banks via supervisory boards is discussed by contemporary and modern literature (e.g. *Jeidels 1905*; *Hilferding 1910*; *Guinnane 2002*; *Burhop 2006a*). *Fohlin (2007)* shows that approximately every second supervisory board exhibited a member that was affiliated with a bank. She also shows that every fifth supervisory board had a chairman or a deputy chairman who was a bank director. *Burhop (2006a)* furthermore shows that the number of chairmen affiliated with banks was increasing over time in the manufacturing industries. Mining companies however experienced a decreasing influence of banks on supervisory boards. Prior literature moreover shows systematic differences between firms with and without bank attachments (e.g. *Fohlin 1997; Fohlin 2007*).[49] *Fohlin (2007)* furthermore shows that these associations differed across different types of banks.[50] However, there is to the best of my knowledge only one paper addressing the endogenous selection of bank directors into supervisory boards and this paper rejects the hypothesis that firms with bank attachments gained easier access to financing (*Fohlin 1998*).

2.2 The German Financial Reporting Regulation before World War I

According to *Par. 260 HGB* the management committee was obliged to prepare an annual report within the first three months after the fiscal year end. This report encompassed a balance sheet, an income statement, and explanatory notes. After the supervisory board finished the audit of the annual report, the management committee had to provide the report and the board's comments on

[49] Firms with a bank affiliated member on the supervisory board were for example larger, slightly older, more profitable, showed higher investment rates, lower leverage ratios and were more often listed on an exchange.
[50] She distinguishes between private banks, provincial banks, and great banks.

the report to the annual shareholder meeting which had to formally approve the annual report (*Par. 260 HGB*). After this approval, the management committee had to immediately publish the balance sheet and the income statement in a newspaper (*Par. 265 HGB*). Additionally, the management committee had to deposit the annual report and the supervisory board's comments on the report at the company register (*Par. 265 HGB*). The German Commercial code at the beginning of the 20th century was shaped by a strict principle based regulation allocating a broad range of decisions to the management's judgment. *Par. 39 HGB* for example merely required firms to provide accurate information on property, plant, and equipment, receivables, cash, other assets, and liabilities. However, the term 'accurate' was not further specified and thus managers only had to follow the abstract guideline of being a 'diligent merchant' (*Hoffmann and Detzen 2013*). Of course, this enabled managers to almost voluntarily choose a level of disaggregation of financial information and *Günther (2015a)* shows that managers applied this freedom.[51] The high level of principle based regulation was also realized with respect to the valuation of assets. According to *Par. 261 HGB* managers had to value current assets following the 'lower of cost or market' principle. Non-current assets, in contrast, had to be valued with amortized costs. Once again, the German Commercial Code did not clarify how exactly non-current assets had to be depreciated. *Par. 261 HGB* merely suggested an amount that 'matches the deterioration'. Thus, managers also faced a high level of discretion with respect to the valuation of assets that was once again only limited by the abstract guideline of being a 'diligent merchant' (*Hoffmann and Detzen 2013*).

[51] *Günther (2015a)* analyzes the time period between 1890 and 1894. However, the financial reporting regulation at this time is comparable with the financial reporting regulation of the *HGB*.

2.3 Contribution to Prior Literature

This paper analyzes the association between bank-dominated supervisory boards and earnings management in Imperial Germany. As a consequence it adds to both, the historical and modern accounting and finance literature.

Firstly, this study adds to research on the influence of banks on German firms before World War I. Section 2.1 shows that it is still an unresolved question whether bank affiliated supervisory board members evolved an influence on the supervised firms. Financial reporting as a major firm-level information device is a suitable channel to evaluate this influence. *Fohlin (2007)* e.g. already shows a statistically and economically significant difference between the depreciation rates of firms with and without bank attachments. However, she does not focus on this issue and she does not consider the endogenous nature of the relation. Moreover, this paper adds to the historical accounting literature by offering large scale evidence on earnings management in Imperial Germany. Prior research in this area, in contrast, is focusing on small samples and/or disclosure choices (e.g. *Westermann 1966*; *Pleitgen 2005*; Günther *2015a*).

Secondly, this study adds to research analyzing the association between independent financial experts on corporate boards and earnings management. *Klein (2002)* shows that the proportion of outside directors is negatively associated with abnormal accruals. Furthermore, she finds an increase in abnormal accruals after a switch from a board that is dominated by outside directors to a board covering a minority of outside directors. In addition, *Xie et al. (2003)* and *Park and Shin (2004)* show that monitoring by financial experts is negatively associated with the level of abnormal accruals. *Peasnell et al. (2005)* find that firms are less likely to manage earnings upwardly to avoid losses or earnings decreases if they show a high proportion of outside directors. *Beasley (1996)* shows that firms with more outsider directors are less likely to commit fraud.

Agrawal and Chadha (2005) as well as *Farber (2005)* finally show that irregularities and restatements are less probable if the board covers outside directors being classified as financial experts. Taken together, prior research might suggest that monitoring by independent financial experts is effective and thus, generally reduces earnings management. However, *Jaggi et al. (2009)* find that this effect is moderated by family members sitting on the boards of family-owned firms. *Garcia Osma and Gill-de-Albornoz Noguer (2007)* even show that outside directors can be positively associated with earnings management in certain settings. Finally, *Chiu et al. (2013)* confirm that board compositions are not obviously related to earnings management by showing that firms are more (less) likely to engage in earnings management if they share a director with a firm that shows a high (low) level of earnings management. Thus, prior evidence on the association between board compositions and earnings management is inconclusive (*Armstrong et al. 2010*). In this respect, *Brown et al. (2011)* highlight the importance to acknowledge the institutional context in which boards are operating.

With respect to this context, this study offers a setting that comes at prominent differences compared with settings used in prior research. First, the German Commercial Code at the beginning of the 20th century was extremely principle based (*Hoffmann and Detzen 2013*). While this can help to adapt the financial reporting efficiently to new economic situations (*Watts and Zimmerman 1986*), it requires a high level of monitoring quality to limit the influence of the management's opportunistic motives (*Kothari et al. 2010*). Hence, supervisory boards were truly challenged by the shape of the GAAP. Second, supervisory boards were more important than nowadays. There were no audit committees. There was also no mandatory external auditing and voluntary audits were perceived to be of low quality (*Evans 2003*). And there was also no systematic enforcement of accounting standards as we observe it nowadays. Hence, supervisory boards were actually the only relevant limit to earnings management.

2.4 Expectations on the Banks' Influence

However, while the setting offers two prominent characteristics, i.e. a high level of earnings management opportunities and a high importance of monitoring by supervisory boards, prior literature does not allow for clear hypotheses. In contrast, I expect three potential associations between bank-dominated supervisory boards and earnings management. First, there might be a negative association. Supervisory board members exhibiting a professional background in the financial industries are supposed to bring a higher level of financial expertise to the board meetings and thus, should have a more distinct skill set to identify opportunistic earnings management. However, this expectation assumes that bank directors act in the interest of the shareholders and thus, are interested in reducing information asymmetries. If bank directors in contrast follow their own agenda, this might result in a positive association between their presence on supervisory boards and the level of earnings management. Prior literature states that supervisory board members were often engaged in managing activities (*Pohl 1981*). Hence, there might be an overlap between the interests of the management committee and the supervisory board. Moreover, prior literature shows that banks were prominently involved in IPOs and SEOs (*Burhop 2006b*). Since managers tend to engage in earnings management in the pre-offering period to increase initial valuation (e.g. *Teoh et al. 1998*; *DuCharme et al. 2001*) and banks were interested in high initial quotations to increase their earnings (*Burhop 2006b*), this might also trigger a support of earnings management. Nevertheless, *Horn (1979)* states that supervisory boards were sometimes very ineffective in monitoring the management. *Fohlin (1998)* furthermore shows that bank attachments were not associated with easier access to financing. Moreover, prior literature also discusses a consulting function which bank directors might have fulfilled besides their monitoring function

(e.g. Burhop 2006a; *Fohlin 2007)*.[52] Thus, prior studies also provide indications for bank affiliated supervisory board members being unrelated to the level of earnings management. Therefore, I primarily analyze whether bank affiliated supervisory board members are associated with the level of earnings management at all, whereas not presuming a clear effective direction.

Unfortunately, the ambiguity of the expected association is further intensified since there might be a diverging incentive structure of bank directors conditional on the supervised firm type. A bank director sitting on the supervisory board of a public firm might support an income increasing reporting technique to increase the initial valuation in an upcoming SEO. A bank director sitting on the supervisory board of a private firm however might support an income decreasing reporting technique in order to reduce cash outflows via dividends, which in turn decreases the credit default risk. Of course, these arguments are arbitrary. Bank directors sitting on the supervisory board of private firms might also promote income increasing earnings management in order to increase the initial valuation in an upcoming IPO. Bank directors sitting on the supervisory board of public firms might also favour income decreasing earnings management to secure their credit stakes in these firms.

3 Empirical Analyses

3.1 Sample Selection and Industry Classification

This study analyzes the association between bank-dominated supervisory boards and earnings management in Imperial Germany. I investigate both, public and private firms. *Burgstahler et al. (2006)* show that private firms in modern settings engage more intensively in earnings management and I want to capture this potential effect. The *'Handbuch der deutschen Aktien-Gesellschaften'* (*HDA*) constitutes a sufficient data base for my objectives. The *HDA* was pub-

[52] This also applies to discussions on the function of financial experts on corporate boards in modern settings (e.g. *Faleye et al. 2011*).

lished between 1897 and 1998 covering German corporations. The coverage e.g. comprises the balance sheets, the income statements, and information on the supervisory boards. In particular, the *HDA* indicates whether a supervisory board member is affiliated with a bank. Panel A of table 1 presents the sample selection.

[Table 1 about here]

To avoid an influence of the first time adoption of the *HGB* in 1900, I choose the *HDA Vol. 9 (1904/05)* covering the fiscal year 1903 as a starting point. In this volume I identify 6986 firms. Since I want to investigate five consecutive fiscal years, I check whether these firms are still covered by the *HDA Vol. 13 (1908/09)*. I exclude 436 firms that are not covered by this volume. Afterwards, I exclude 605 banks and 165 insurance companies since I want to analyze the association between bank attachments and earnings management and not the earnings management of financial firms. I also exclude 210 railway companies since the German government aimed at socialization in this sector and thus, these firms were exposed to a special influence. I end up with a population of 5570 constantly covered industrial corporations. 511 firms were listed on the Berlin Stock Exchange (BSE). I randomly select 50 out of these firms to construct my sub-sample of public firms. The BSE was not the only stock exchange in Imperial Germany but by far the largest one (*Fohlin 2007*). By restricting the sample to the main exchange, I avoid the consideration of incentives to list on different regional exchanges. Of course, it is also a choice to list on the main exchange. However, I expect firms listed on the BSE to most clearly face the incentive structure of public firms. To construct a sub-sample of firms that most clearly represent private firms, I randomly select 50 firms out of the remaining 5059 firms which fulfil the following requirements.[53] Firstly, I demand information on the balance sheet, the income statement, and the supervisory board for the full observation period since the early volumes of the *HDA* do not al-

[53] If a firm does not fulfil one of the requirements, I choose the firm listed directly below in the *HDA*.

ways cover this information for small private firms. Secondly, I do not consider firms that are listed on a regional exchange or show listed debt. Thirdly, I do not consider firms that initiated their liquidation between 1903 and 1907. I end up with a balanced panel of 500 firm-years equally composed of public and private firms.

Panel B of table 1 shows the industry classification. The industry classification is based on *Hoffmann (1965)*. In contrast to his classification I expand the category 'construction' to 'construction and construction materials'. I also expand the category 'mining' to 'mining and steel producer'. Furthermore, I merge 'metal processing' and 'engineering' as well as 'textiles' and 'clothes'. The two largest industries (metal processing and engineering; food, breweries, and sugar factories) comprise one third of the sample. The two smallest industries (construction and construction materials; wood processing) in contrast only represent 10% of the sample. The results furthermore show imbalances within the industries between public and private firms. 10 out of 12 firms assigned to 'mining and steel producer' are publicly listed while all firms assigned to 'glass, porcelain and pottery' are private. The first finding can be explained by the high capital needs of such companies. However, the second finding does not follow an obvious explanation. Hence, the results of this study must be carefully interpreted since I can not rule out that the sample is not representative for the population.

3.2 Bank-Dominated Supervisory Boards

In order to approach my research question, I hand-collect firm-level data on the supervisory boards, the balance sheets, the income statements, and other firm-level characteristics from the *HDA*. Table 2 shows summary statistics of the supervisory boards.

[Table 2 about here]

The supervisory boards comprise on average 5.62 members. The smallest board consists of three members, which is the minimum stipulated by *Par. 243 HGB*. The maximum of 34 members is attributable to a very large mining company. The results are comparable with *Fohlin (2007)* who reports a mean of 5.39 members and a maximum of 21. 57% of the supervisory boards show at least one member affiliated with a bank. However, the share of bank affiliated supervisory board members is rather low (mean of *bank_quota*: 0.16). This also applies to the absolute number of bank affiliated members. If a bank director is present on the supervisory board, he is usually the only bank affiliated member (3rd quartile of *bank_member*: 1.00). Nevertheless, bank directors occupy the position of the chairman or the deputy chairmen in many cases (mean of *bank_dominance*: 0.31). This supports the assumption of *Fohlin (2007)* that these positions are more influential than normal board positions. Since banks are constraint in their resources, they delegate only one bank director per supervisory board and ensure that he is influential enough to represent the bank's opinions.[54] Albeit, *Fohlin (2007)* only finds a bank affiliated (deputy) chairman in 22% of the cases, *Burhop (2006a)* shows that this number is susceptible toward the weighting of industries in the sample. The sub-sample analyses of public and private firms reveal that supervisory boards of private firms are on average smaller and less influenced by banks. This is not surprising since private firms are smaller and banks are not interested in sitting on supervisory boards of firms that are of minor importance.

3.3 Earnings Management

After showing that the supervisory boards are indeed substantially influenced by banks, I investigate whether firms manage their earnings. In order to approach this question, I first visually inspect the reported earnings (growth) displayed in figure 1 and figure 2.

[54] If I exclude observations without a bank affiliated supervisory board member (*bank_quota = 0)*, I observe a bank affiliated chairman or deputy chairman in almost 55% of the cases.

[Figure 1 about here]

[Figure 2 about here]

Figure 1a reveals that 46 firm-years show a positive *roa* equal to or below 1% while only seven firm-years show a negative *roa* equal to or above -1%. Figure 2a shows that this discontinuity is also present for *earnings_growth*; although to a lesser extent. While 91 firm-years show a positive *earnings_growth* equal to or below 1%, 67 firm-years show a negative *earnings_growth* equal to or above -1%. These earnings kinks are present for both, public and private firms. However, private firms show the visually more pronounced patterns.[55]

Earnings kinks are known from modern settings (*Burgstahler and Dichev 1997*). Prior studies also show that earnings kinks are more pronounced for private firms (*Burgstahler et al. 2006*). However, it might be surprising to find these patterns in a sample of firms which operated more than 100 years ago. Potential explanations for the presence of earnings kinks in my setting might arise from contractual agreements. Managers e.g. might want to avoid losses in order to avoid a breach of debt covenants. However, there are to the best of my knowledge no indications for debt covenants in Imperial Germany.[56] I do also not find systematic differences between small loss and small profit firms with respect to the average debt quota in untabulated analyses. This also applies to average bonus compensation and dividends. Thus, I do not find indications for the earnings kinks being related to contractual agreements. However, this finding is based on only seven firm-years showing a small loss and hence must be carefully interpreted. Another potential explanation for the tendency to avoid losses in my setting might arise from tax incentives.[57] If firms are not able to offset losses in future periods, they should be interested in avoiding losses.

[55] Untabulated chi² tests employing a binary dummy indicating whether a firm reports a small profit confirm that private firms are more likely to report a small profit. However, I do not find evidence consistent with private firms reporting a small earnings increase more often. A small profit (small earnings increase) is defined as *roa* (*earnings_growth*) within the [0; 0.01] interval.

[56] The historical institute of the Deutsche Bank e.g. covers approximately 40 historical debt contracts. However, these contracts are related to mortgages and do not directly refer to financial statements.

[57] Corporate income taxes were based on financial statements.

However, firms were able to settle a tax loss carryforward within the next two periods (*Par. 10 Preußisches EStG 1891*; *Par. 9.3 Preußisches EStG 1906*). This is rather short and it might explain the tendency to avoid larger losses. However, it does not obviously explain the tendency to avoid small losses. A tax related explanation is unlikely anyway as the maximum tax rate accounted for 4% (*Par. 17 Preußisches EStG 1891*, *1906*). Thus, the economic benefits of influencing the taxable income were rather small. Nevertheless, if taxation was conditional on the firm type, tax incentives might at least explain the more pronounced small loss avoidance of private firms. However, I can rule this out since the tax law did not differentiate between public and private corporations (*Par. 16 Preußisches EStG 1891*; *Par. 15 Preußisches EStG 1906*). With respect to the more pronounced earnings kink for private firms, *Burgstahler et al. (2006)* argue that managers of public firms tend to refrain from earnings management due to extensive disclosure requirements and minority shareholder rights. Since mandatory disclosure and investor protection were rather moderately developed (*Franks et al. 2006*),[58] public and private firms should actually show an equal level of earnings management in my setting. However, *Burgstahler et al. (2006)* also argue that public firms show lower levels of earnings management if they face highly developed capital markets. This supports the notion that the BSE was not as immature as often assumed (*Fohlin 2007*). Instead, my findings are consistent with firms listed on the BSE facing comparable incentives like firms listed on modern capital markets. However, this discussion assumes that earnings kinks are indicative of earnings management. Some studies question this view and show that alternative explanations arise from sample biases and scaling issues (*Durtschi and Easton 2005, 2009*). Nevertheless, I observe that the kinks disappear once I adjust earnings for depreciations. This pattern is at least consistent with earnings management.

[58] While blocking minorities (25% of equity; e.g. *Par. 207 HGB*) and the privilege to demand special audits (10% of equity; *Par. 266 HGB*) were present, insider trading was e.g. not prohibited.

In general, prior literature does not only focus on depreciations but analyzes total (abnormal) accruals (*Dechow et al. 2010*). However, the firms in my sample report very heterogeneously due to the comparably unregulated financial reporting environment. Some firms only show aggregate receivables and cash (equivalents). Some firms show provisions, others do not. Some firms provide detailed information on depreciation, allowances, and provisions in their income statements, while others only report on depreciations. Taken together, I only find one position commonly reported by my sample firms, i.e. depreciations. Hence, I focus on this position. Of course, firms might also use other channels of (accrual) earnings management and hide this in an opaque financial statement. However, if I assume that these channels are on average of minor importance since earnings management strategies were not as developed as they are nowadays, this setting allows me to investigate one distinct channel which managers can use to influence reported earnings.[59] Nevertheless, total depreciations are the sum of non-discretionary and discretionary depreciations and only the discretionary component is indicative of earnings management. Thus, I employ an accrual model that is based on a variant of the Modified Jones Model proposed by *Kothari et al. (2005)* to isolate the discretionary part of depreciations.[60] Discretionary depreciations (*discret_depr*) are therefore the residual of the following cross-sectional regression within the same industry-year:

(1) $$depreciations_{it} = \alpha_0 + \alpha_1 (1/total\_assets_{it}) + \alpha_2 PPE_{it} + \varepsilon_{it}.$$

[Table 3 about here]

Table 3 shows summary statistics of these discretionary depreciations and of earnings (growth) before and after depreciation. The results show that firms are on average profitable (mean of *roa*:

[59] The amount of depreciations accounts on average for 95% of the amount of positions in the income statement related to depreciations, allowances, and provisions.

[60] See equation (6) of *Kothari et al. (2005)*. The model actually employs total accruals as dependent variable and considers the change in revenues and the change in receivables. However, I am not able to fully replicate this model due to missing data.

0.0564) and earnings are slightly growing over time (mean of *earnings_growth*: 0.0058). Firms depreciate on average 5.7% of property, plant, and equipment per year. This is consistent with *Fohlin (2007)* who reports a mean depreciation quota of 5.8%. Some firm-years show very high depreciation quotas (maximum of *depr_quota*: 0.6250). However, *Fohlin (2007)* also states that her sample contains extreme outliers.[61] The sub-sample analyses furthermore reveal that private firms are less profitable and show lower depreciation quotas. However, the level of depreciations does not per se indicate earnings management. Thus, I also analyze the discretionary component of depreciations. I find a reasonable dispersion of discretionary depreciations across firms (inter-quartile range of *discret_depr*: 0.0336), which is indicative of managers using their freedom to value assets. This conclusion is backed by contemporaneous literature stating that depreciations follow profits pro-cyclically (*Schmalenbach 1908/09*). However, I do not find differences between public and private firms with respect to average (absolute) discretionary depreciations.

3.4 Additional Firm-Level Characteristics and Univariate Associations

Before I conduct my main analyses, I investigate additional firm-level characteristics that can serve as additional explanatory variables. Table 4 shows summary statistics of these variables.

[Table 4 about here]

The results show that total assets are highly right-skewed distributed (mean of *total_assets*: 7,829,328 Mark; median of *total_assets*: 2,169,357 Mark).[62] Hence, I use logarithmic values in the main analyses. Moreover, firms are relatively lowly leveraged (mean of *debt_to_equity: 0.6005*) and heterogeneously distributed across the German Empire. While some firms are directly located in Berlin (minimum of *distance_Berlin*: 0 km) the average firm is operating 291 km away from the financial centre of Imperial Germany. Firms are furthermore relatively young

[61] Untabulated analyses show that my findings are robust against a winsorizing of depreciations at the 1% (5%) level.
[62] *Wehler (1994)* reports a per-capita income of approximately 592 Mark for the 1900s in Imperial Germany. Thus, my sample firms are economically meaningful.

(mean of *age:* 16.9 years). This is not surprising, since the incorporation of firms was heavily restricted before 1870 and most of the early corporations did not withstand a severe stock market crisis in the 1870s. Moreover, firms pay an average dividend of 6.97% per year. This is comparable with *Günther (2015b)* who reports an average dividend of 7.73% in 1895.[63] In addition, the sub-sample analyses show that private firms pay fewer dividends and are smaller, younger, and more leveraged. Table 5 shows univariate associations.

[Table 5 about here]

discret_depr and *depr_quota* are highly positively and significantly correlated, which is mechanically intended. Furthermore, I find a high positive and significant correlation between *bank_dominance* and *bank_quota*. However, while *bank_dominance* shows a positive and significant correlation with *discret_depr,* | *discret_depr* | , and *depr_quota*, *bank_quota* is not related to the level of (discretionary) depreciations.[64] Hence, I employ *bank_dominance* as proxy for the banks' influence in the following analyses. The higher level of depreciations for firms with bank-dominated supervisory boards has been shown by *Fohlin (2007)* before. However, she does not provide evidence that depreciations are used to manage earnings. Moreover, firms with bank-dominated supervisory boards pay more dividends and are more profitable, less leveraged, younger, and more often listed on an exchange. These findings are also mainly consistent with *Fohlin (2007)*. However, *Fohlin (2007)* reports a positive association between bank affiliated supervisory board members and leverage. Since banks should be interested in closely monitoring firms with high leverage ratios to reduce the credit default risk, her finding is more intuitive. However, since bank directors might also fulfill a consulting function besides their monitoring function, the relation is not unambiguously positive.

[63] These values are based on the face value of shares. A firm showing a 100.000 Mark face value of shares that pays a 10.000 Mark cash dividend thus pays a dividend of 10%.

[64] This supports *Fohlin (2007)* who assumes that the chairman and the deputy chairman were more influential than normal board members.

3.5 Bank-Dominated Supervisory Boards and Earnings Kinks

Chapter 3.2 reveals that the sample firms' supervisory boards are substantially influenced by bank directors. Chapter 3.3 shows evidence consistent with firms managing their earnings. In order to investigate whether there is a link between these two findings, I first analyze whether bank-dominated supervisory boards are associated with the earnings kinks. I conduct logit regressions employing a binary dependent dummy variable indicating whether a firm reports a small profit (small earnings increase) or a small loss (small earnings decrease).[65] The results of these analyses are presented in table 6.

[Table 6 about here]

Model (1) - (3) show that firms are more likely to report a small profit if they are more leveraged, smaller, and older. This is consistent with *Dechow et al. (2003)* who show in a modern setting that small profit firms are more leveraged, smaller, and older than small loss firms. Furthermore, I find that private firms are more likely to report a small profit. This is also consistent with prior research (*Burgstahler et al. 2006*). Moreover, I find that the level of discretionary depreciations does not differ between small profit and small loss firms, which has also been shown by prior literature (*Dechow et al. 2003*). Nevertheless, this does not necessarily imply that the earnings kink is not indicative of earnings management. Model (3) reveals that firms in the small profit bin show higher absolute discretionary depreciations, which is consistent with earnings management. The very high coefficient of $|discret\_depr|$ most likely arises from data sparseness due to the small sample size. Untabulated analyses show that the coefficient is less extreme once I increase the sample by changing the intervals selecting firms into the small profit (small loss) bin.[66] However, I do not find a statistically significant association between *small_profit* and

[65] The binary dummy variables equal 0 if the firm reports a *roa* (*earnings_growth*) within the [-0.01; 0[interval. The binary dummy variables equal 1 if the firm reports a *roa* (*earnings_growth*) within the [0; 0.01] interval.

[66] For example, I find 10 (15) firms reporting a negative *roa* above -1.5% (-2%) and 57 (68) firms reporting a positive *roa* below 1.5% (2%). The coefficient of $|discret\_depr|$ is 53.8064 (33.7082) in these cases.

bank_dominance. This indicates that the presence of bank directors on supervisory boards does not affect the management's reporting decisions. This impression is corroborated by model (4) - (6) since I do also not find a significant association between *small_growth* and *bank_dominance*. These models also show that firms are more likely to report a small earnings growth if they are larger. Moreover, I do not find systematic differences in (absolute) discretionary depreciations between firms showing a small earnings increase and firms showing a small earnings decrease. Nevertheless, this does also not necessarily imply a rejection of the earnings management hypothesis. For illustration, assume two identical firms. One firm chooses to employ the normal depreciation rate and ends up in the small earnings decrease bin, the other firm chooses to employ a depreciation rate just slightly below normal depreciations and ends up in the small earnings increase bin. Hence, one firm manages the earnings, the other firm does not. However, the difference in (discretionary) depreciations will not be large enough to be statistically significant. Finally, I find that public firms are less likely to show a small earnings increase. This is not consistent with *Beatty et al. (2002)* who show a higher likelihood to avoid small earnings decreases for public firms. However, their results are based on a sample of banks. Hence, the diverging results might be driven by the usage of different industries. Taken together, my results do not support a significant association between the presence of bank directors on supervisory boards and the earnings kinks.

3.6 Bank-Dominated Supervisory Boards and Depreciations

After rejecting an association between bank-dominated supervisory boards and the earnings kinks, I analyze the overall level of (absolute) discretionary depreciations. The firm-years around the kinks are only a small sub-sample of the overall distribution. An exclusive focus on this interval might miss a general support of certain reporting techniques by bank directors. To address the endogenous selection of bank directors into supervisory boards, I employ a propensity score

matching. I choose the nearest neighbor matching method with a caliper of 5%. I follow prior literature (e.g. *Lerner 1995*) and expect a supervisory board to be more likely dominated by bank directors if the firm's headquarter is located close to the bank's headquarter. Berlin was the major financial centre of Imperial Germany and most major banks were operating in Berlin (*Fohlin 2007*). Thus, I expect a negative association between bank-dominated supervisory boards and the distance between a firm's headquarter and Berlin. Compared with research using modern settings, the argument that long distances inhibit individuals from traveling and thus from sitting on certain supervisory boards is even more compelling. There were no planes, no highways, and trains were rather slow. Moreover, communication channels were rather underdeveloped. Telegraphs and telephones were invented and commonly used (*Weigt 2005*). However, especially the possibility to electronically transfer documents was considerably restricted. Thus, being personally present at the meetings of the supervisory boards was actually indispensable. Hence, it is plausible that bank directors refrained from taking positions on supervisory boards which implied long traveling. However, I do not have clear expectations with respect to other factors explaining the presence of bank directors on the supervisory board since bank directors might fulfill a consulting function besides their monitoring function.[67] Table 7 shows the results of the propensity score matching.

[Table 7 about here]

It is more likely that the supervisory board of a public firm shows a bank director if the firm's headquarter is close to Berlin. This is consistent with my expectation. However, I find the oppo-

[67] I employ earnings before depreciation as a proxy for profitability. I employ the logarithm of total assets as a proxy for firm size. I employ leverage as a proxy for the capital structure. Finally, I consider firm age and the level of cash dividends as explanatory factors.

site effect for private firms.[68] Bank directors are also more likely to select into firms which are more profitable, lower leveraged, younger, and paying less dividends. With respect to firm size I again find opposing effects for public and private firms.[69] While bank directors are less likely to sit on the supervisory boards of large public firms, they are more likely to sit on the supervisory boards of large private firms. This might indicate that large public firms are better able to evade from the banks' influence while large private firms are seeking for bank directors in order to get access to the banks' financial expertise. However, one must be careful with such interpretations since I am not able to derive causal chains for the selection of bank directors into certain firms. Panel B shows that the propensity score matching improves the identification of the bank directors' influence by significantly reducing the differences between the treatment and the control groups. Finally, panel C and D show the average treatment effect of *bank_dominance* on *discret_depr*, respectively $|$ *discret_depr* $|$. I do not observe a difference in (absolute) discretionary depreciations before and after the matching for private firms. In contrast, I find a statistically significant difference in (absolute) discretionary depreciations for public firms. However, this difference is not robust against the propensity score matching. Taken together, I do not find differences in (absolute) discretionary depreciations between firms supervised by bank directors and firms without such bank attachments. This corroborates the findings of chapter 3.5. Bank affiliated supervisory board members did not restrict or support certain reporting techniques. The results rather indicate that bank directors were not more or less effective in monitoring than other board members.

[68] *Riesser (1912)* shows that large German banks had a widespread network of branches. Thus, my proxy for the distance between the bank's headquarter and the firm's headquarter might be too raw. However, the diverging results for public and private firms persist if I use finer measures for the distances e.g. by considering the smallest distance between the firm's headquarter and Berlin, Breslau, Hamburg, Frankfurt a.M., and Munich.

[69] The divergence of selection effects conditional on the firm type prevents the usage of a pooled sample. The large differences between public and private firms, e.g. with respect to *total_assets* (see table 4), might interfere with the common support assumption anyway.

3.7 Robustness Checks

In order to rule out that my results are driven by my research design, I conduct various robustness checks that are presented in table 8. These robustness checks encompass regression analyses employing *discret_depr* and | *discret_depr* | as dependent variables. I firstly employ OLS regressions. However, I use a balanced panel of 500 firm-years and OLS estimators ignore this panel structure by assuming uncorrelated error terms. Thus, I employ GLS regressions in a second step. Finally, I employ two stages least squares regressions using *distance_Berlin* as an instrumental variable for *bank_dominance* to address the endogenous selection of bank directors into supervisory boards.

[Table 8 about here]

The analyses confirm the impression of the main analyses that there is no statistically significant association between the presence of bank directors on supervisory boards and the level of earnings management since each of the specifications displayed in table 8 shows a statistically insignificant association between *bank_dominance* and (absolute) discretionary depreciations.

4 Conclusion

This study analyzes the association between bank-dominated supervisory boards and earnings management in Imperial Germany in the 1900s. My analyses confirm prior literature (e.g. *Fohlin 2007*) by showing a substantial presence of bank directors on supervisory boards. Furthermore, I find the earnings kinks reported by *Burgstahler and Dichev (1997)* and that these kinks disappear once I adjust earnings for depreciations. Based on an accrual model, I furthermore isolate the discretionary part of depreciations and show that managers heterogeneously apply their regulatorily induced freedom in valuing assets. These findings are consistent with earnings being managed. However, I do not find indications for bank-dominated supervisory boards being related to earnings management. This finding adds to prior literature in at least two ways. Firstly, I add to

the discussion on the banks' influence on corporations in Imperial Germany. By rejecting an association between bank-dominated supervisory boards and earnings management, I support the perspective of *Fohlin (1998)* that bank attachments did not evolve a measurable influence on the supervised firms. This in turn adds in a more general way to the discussion on the universal banks' position in Imperial Germany. While prior qualitative historical literature often claims that these banks evolved an overwhelming influence on corporations my results support *Fohlin (2007: 327)* who concludes: "Banks do not - and never did - control most of the corporate economy. Broadly speaking the idea of the banks' domination of corporate ownership or control is just as much a myth for present-day Germany as it is for the industrialization period." However, my results do not necessarily impose that supervisory boards were ineffective in monitoring. My findings merely support the notion that bank directors were not more or less effective in monitoring than other board members. Secondly, I add to literature on the interplay of board compositions and earnings management (e.g. *Klein 2002; Xie et al. 2003; Park and Shin 2004; Garcia Osma and Gill-de-Albornoz Noguer 2007*; *Jaggi et al. 2009*) as well as to regulatory discussions on desirable monitoring structures. While recent corporate governance regulations aim at an increase of financial expertise on corporate boards, the results of this study support the notion that an exogenously imposed board composition does not ipso facto increase the monitoring quality.

However, while I am able to show associations in a setting that comes at noticeable differences in the institutional context compared with settings used in prior research, i.e. a very high level of earnings management opportunities and a very high importance of monitoring by supervisory boards, I am not able to derive causal conclusions for various reasons. Firstly, I am not able to show whether bank directors had to fulfill a monitoring role on the supervisory boards. Prior literature also discusses a consulting function that these board members might have fulfilled (*Burhop 2006a*). Therefore, I am also not able to predict how bank directors selected themselves

into certain firms. Secondly, I do also not consider the choice to become publicly listed or stay private. The selection of bank directors into certain firms is actually the second stage after selecting the firm type. In this study, I assume that this selection is exogenous, which hinders me in identifying causal relations. Thirdly, I am also not able to sufficiently measure earnings management since the comparably unregulated financial reporting environment hinders me in identifying other aspects of earnings management than discretionary depreciations. My impression is that other accrual based earnings management techniques were of subordinated importance since financial statements were not as dynamic as they are nowadays (*Hoffmann and Detzen 2013*). However, I can not rule out that firms engaged in earnings management techniques that are hidden in an opaque financial statement.

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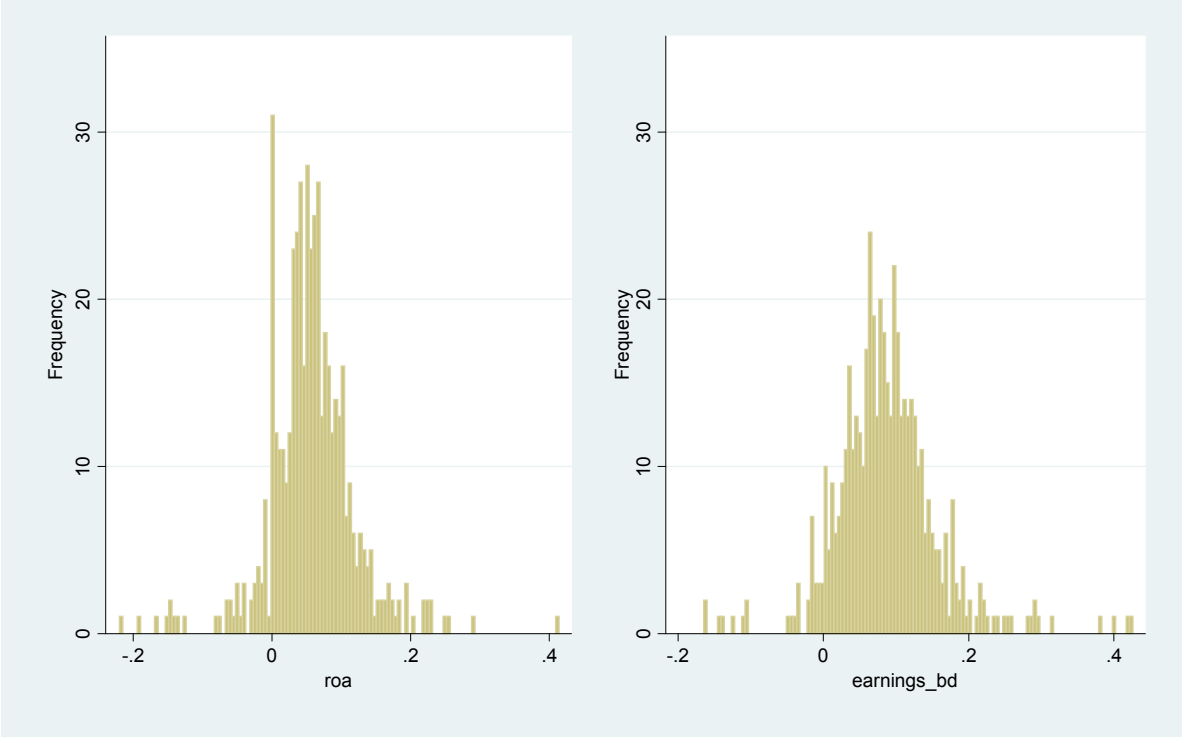
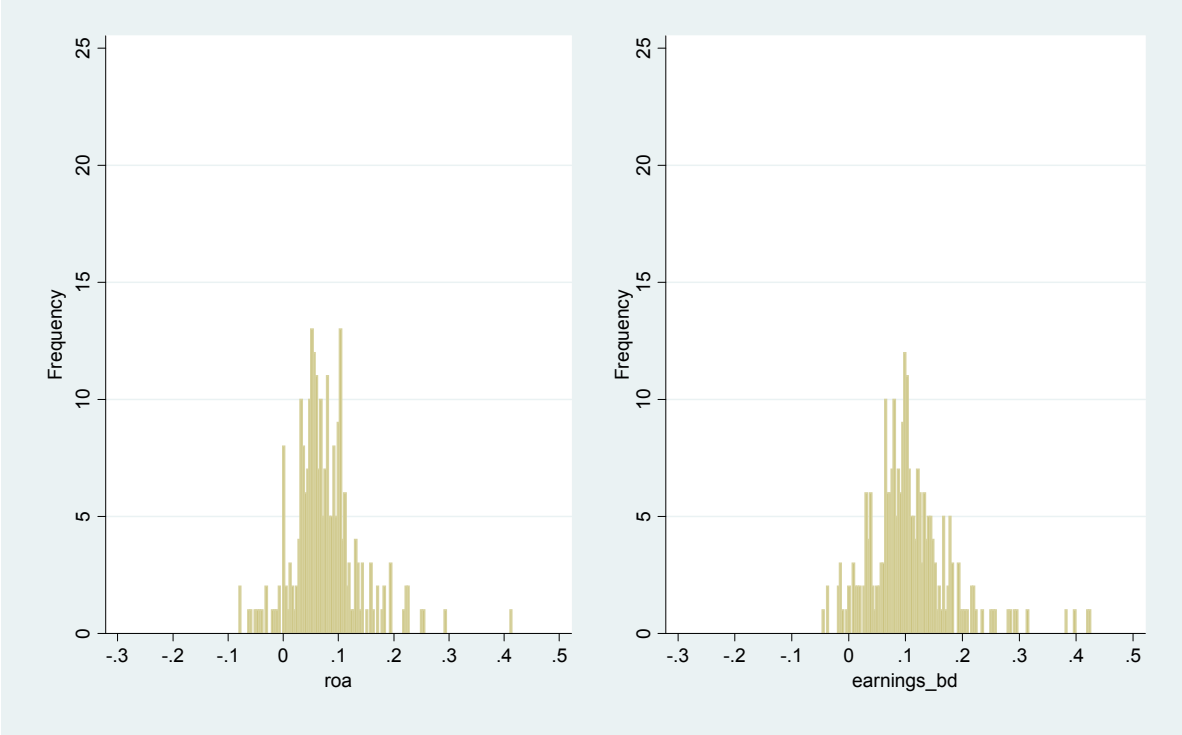
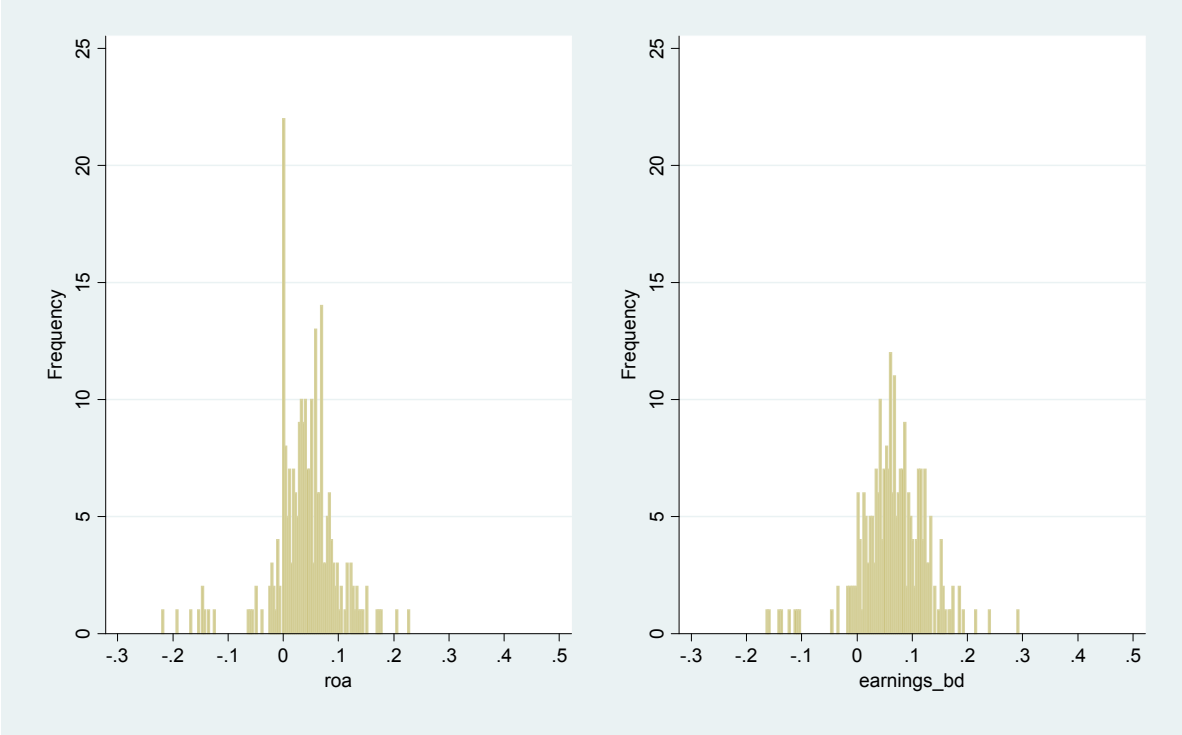
Figure 1: Earnings before and after Depreciation
1a: All Firms



1b: Public Firms

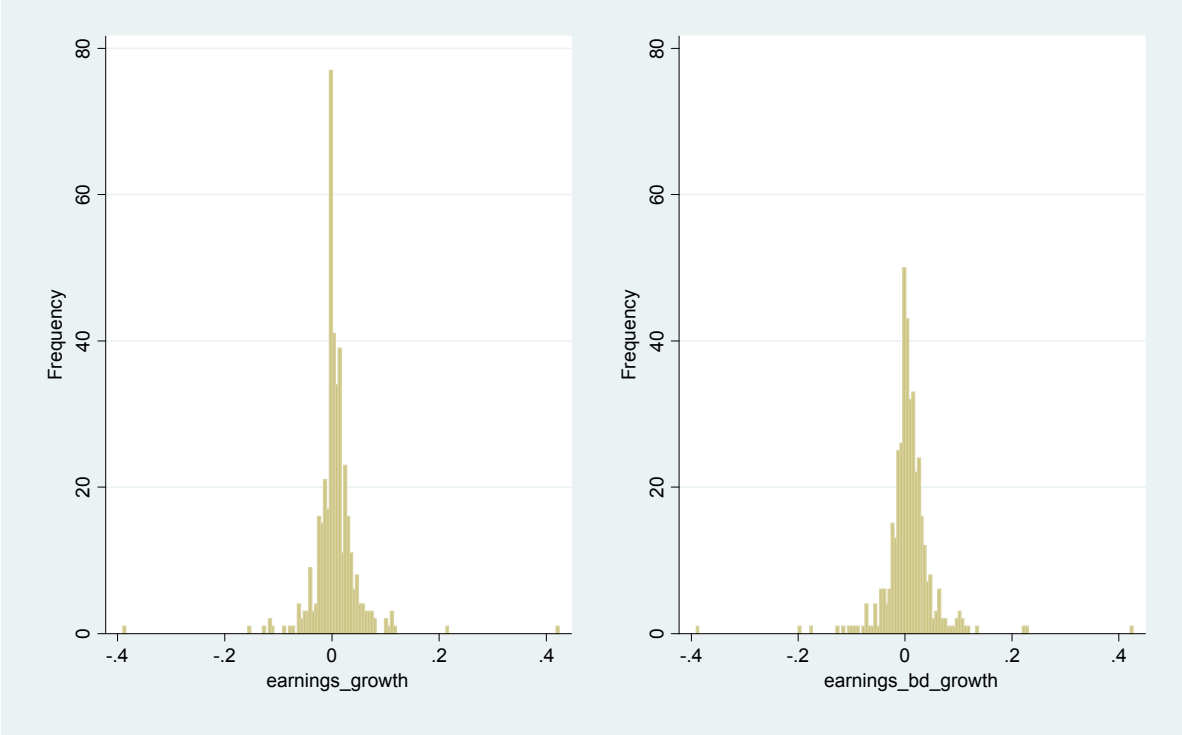


1c: Private Firms

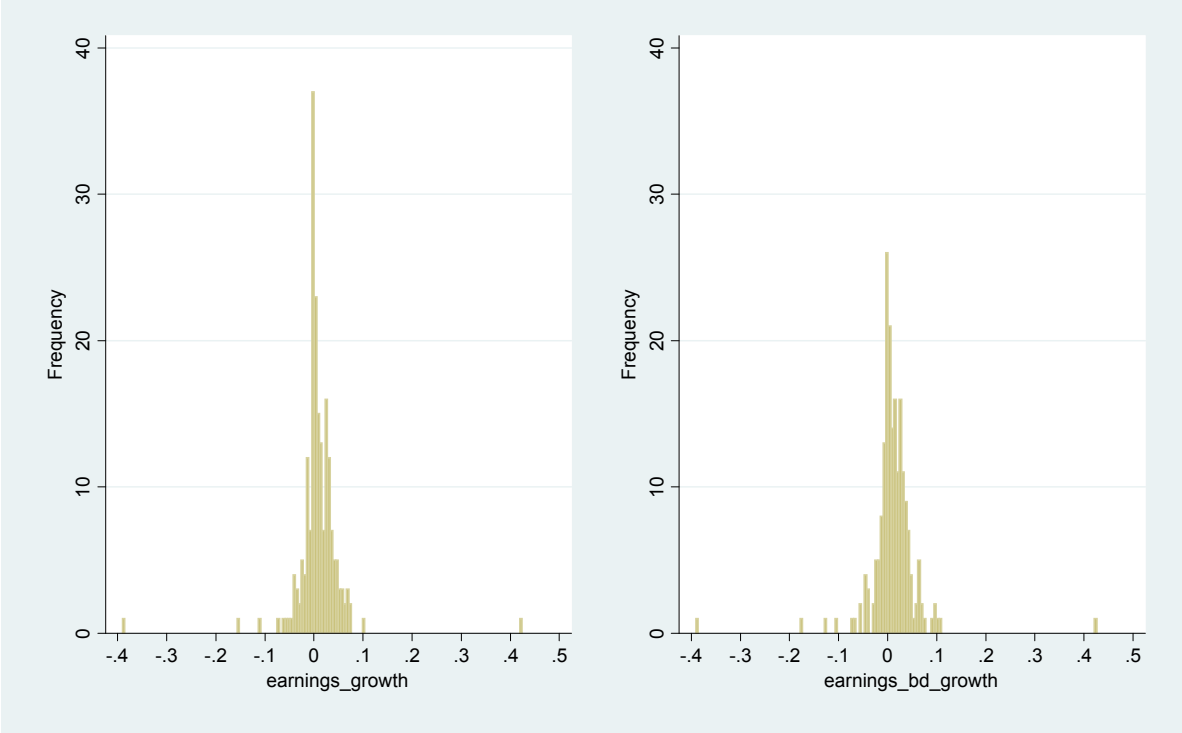


This figure shows the distribution of earnings before and after depreciation of 100 German firms for the fiscal years 1903-1907. *roa* is net income over total assets. *earnings_bd* is (net income + depreciations) over total assets. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09).*

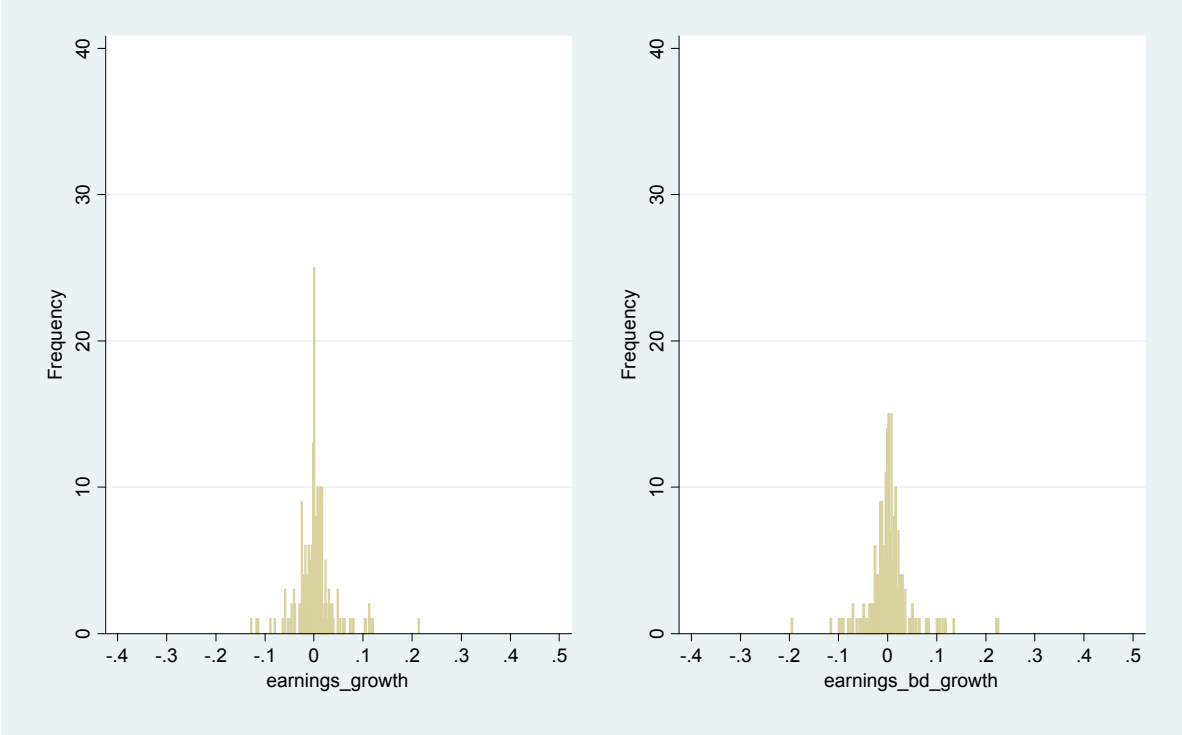
Figure 2: Growth of Earnings before and after Depreciation
2a: All Firms



2b: Public Firms



2c: Private Firms



This figure shows the distribution of the growth of earnings before and after depreciation of 100 German firms for the fiscal years 1903-1907. *earnings_growth* is the difference between net income and prior year's net income scaled by average total asset. *earnings_bd_growth* is the difference between (net income + depreciations) and prior year's (net income + depreciations) scaled by average total assets. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09).*

Table 1: Sample Selection and Industry Classification

Panel A: Sample Selection

Firms listed in *'Handbuch der deutschen Aktiengesellschaften' Vol. 9 (1904/05)*	6986
- Firms not listed in *'Handbuch der deutschen Aktiengesellschaften' Vol. 13 (1908/09)*	- 436
- Banks	- 605
- Insurance companies	- 165
- Railway companies	- 210
Population of constantly covered industrial corporations	**5570**
a) Industrial corporations listed on Berlin Stock Exchange	511
b) Industrial corporations not listed on Berlin Stock Exchange	5059
50 randomly selected firms out of a)	
50 randomly selected firms out of b) which fulfil the following requirements:	
- Balance sheet and income statement available for fiscal years 1903-1907	
- Data on supervisory board available for fiscal years 1903-1907	
- No listing on regional exchange between 1903-1907	
- No debt listed on any exchange between 1903-1907	
- No liquidation initiated between 1903-1907	
Final Sample	**100**

Panel B: Industry Classification

	Industry Name	# Public Firms	# Private Firms	# Firms
1	glass, porcelain and pottery	0	7	7
2	construction and construction materials	3	2	5
3	metal processing and engineering	14	6	20
4	chemical industries	5	4	9
5	textiles and clothes	4	6	10
6	food, breweries and sugar factories	5	8	13
7	gas, electricity and water supply works	4	2	6
8	mining and steel producer	10	2	12
9	wood processing	1	4	5
10	miscellaneous	4	9	13
		50	50	100

This table shows the sample selection as well as the industry classification. The industry classification is based on *Hoffmann (1965)*.

Table 2: Summary Statistics of Supervisory Boards

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
full sample								
size_board	500	5.62	2.93	3.00	4.00	5.00	6.00	34.00
bank_present	500	0.57	0.49	0.00	0.00	1.00	1.00	1.00
bank_member	500	0.91	1.08	0.00	0.00	1.00	1.00	5.00
bank_quota	500	0.16	0.17	0.00	0.00	0.17	0.25	0.83
chairman_bank	500	0.17	0.38	0.00	0.00	0.00	0.00	1.00
deputy_bank	500	0.17	0.37	0.00	0.00	0.00	0.00	1.00
bank_dominance	500	0.31	0.46	0.00	0.00	0.00	1.00	1.00
public firms								
size_board	250	6.09	3.66	3.00	5.00	5.00	6.00	34.00
bank_present	250	0.77	0.42	0.00	1.00	1.00	1.00	1.00
bank_member	250	1.36	1.22	0.00	1.00	1.00	2.00	5.00
bank_quota	250	0.23	0.18	0.00	0.14	0.20	0.33	0.83
chairman_bank	250	0.22	0.42	0.00	0.00	0.00	0.00	1.00
deputy_bank	250	0.21	0.41	0.00	0.00	0.00	0.00	1.00
bank_dominance	250	0.39	0.49	0.00	0.00	0.00	1.00	1.00
private firms								
size_board	250	5.15***	1.83	3.00	4.00	5.00***	6.00	15.00
bank_present	250	0.38***	0.49	0.00	0.00	0.00***	1.00	1.00
bank_member	250	0.45***	0.65	0.00	0.00	0.00***	1.00	3.00
bank_quota	250	0.09***	0.13	0.00	0.00	0.00***	0.20	0.67
chairman_bank	250	0.13***	0.33	0.00	0.00	0.00***	0.00	1.00
deputy_bank	250	0.12***	0.33	0.00	0.00	0.00***	0.00	1.00
bank_dominance	250	0.24***	0.43	0.00	0.00	0.00***	0.00	1.00

This table shows descriptive statistics of the supervisory boards of 100 German firms for the fiscal years 1903-1907. *size_board* is the absolute number of board members. *bank_present* is a binary dummy variable that equals 1 if at least one supervisory board member is affiliated with a bank, and 0 otherwise. *bank_member* is the absolute number of board members affiliated with a bank. *bank_quota* is the relative number of board members affiliated with a bank and defined as *bank_member* over *size_board*. *chairman_bank* is a binary dummy variable that equals 1 if the chairman is affiliated with a bank, and 0 otherwise. *deputy_bank* is a binary dummy variable that equals 1 if the deputy chairman is affiliated with a bank, and 0 otherwise. *bank_dominance* is a binary dummy variable that equals 1 if the chairman or the deputy chairman is affiliated with a bank, and 0 otherwise. ***/**/* marks significance at the 1/5/10% level based on a one tailed t-test of the difference of the means of public firms and private firms, respectively the chi² test of the mean of dichotomous variables, or the Wilcoxon rank test of the median. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09)*.

Table 3: Summary Statistics of Earnings before and after Depreciation

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
full sample								
roa	500	0.0564	0.0625	-0.2198	0.0269	0.0549	0.0866	0.4144
depr_quota	500	0.0565	0.0485	0.0000	0.0313	0.0506	0.0737	0.6250
discret_depr	500	0.0000	0.0408	-0.1764	-0.0190	-0.0034	0.0146	0.4985
| *discret_depr* |	500	0.0246	0.0331	0.0000	0.0082	0.0172	0.0309	0.4985
earnings_bd	500	0.0877	0.0705	-0.1646	0.0467	0.0832	0.1204	0.4261
earnings_growth	400	0.0058	0.0445	-0.3905	-0.0066	0.0033	0.0183	0.4245
earnings_bd_growth	400	0.0068	0.0489	-0.3911	-0.0091	0.0048	0.0231	0.4267
public firms								
roa	250	0.0744	0.0607	-0.0804	0.0426	0.0666	0.1017	0.4144
depr_quota	250	0.0614	0.0425	0.0000	0.0361	0.0567	0.0786	0.3018
discret_depr	250	-0.0002	0.0359	-0.0859	-0.0200	-0.0049	0.0141	0.2289
| *discret_depr* |	250	0.0248	0.0266	0.0002	0.0085	0.0174	0.0319	0.2289
earnings_bd	250	0.1080	0.0728	-0.0464	0.0671	0.0990	0.1375	0.4261
earnings_growth	200	0.0082	0.0504	-0.3905	-0.0036	0.0057	0.0253	0.4245
earnings_bd_growth	200	0.0104	0.0534	-0.3911	-0.0035	0.0093	0.0275	0.4267
private firms								
roa	250	0.0389***	0.0529	-0.2198	0.0089	0.0404***	0.0683	0.2289
depr_quota	250	0.0516**	0.0534	0.0000	0.0271	0.0414***	0.0661	0.6250
discret_depr	250	0.0002	0.0459	-0.1764	-0.0177	-0.0024	0.0137	0.4985
| *discret_depr* |	250	0.0244	0.0386	0.0000	0.0079	0.0168	0.0293	0.4985
earnings_bd	250	0.0656***	0.0614	-0.1646	0.0359	0.0653***	0.1022	0.2934
earnings_growth	200	0.0033	0.0376	-0.1289	-0.0110	0.0004**	0.0138	0.2150
earnings_bd_growth	200	0.0033*	0.0437	-0.1962	-0.0133	0.0019***	0.0160	0.2263

This table shows descriptive statistics of (the growth of) earnings before and after depreciation of 100 German firms for the fiscal years 1903-1907. *roa* is net income over total assets. *depr_quota* is depreciations over property, plant, and equipment. *discret_depr* is the level of discretionary depreciations and defined as the residual of an accrual model describing the level of depreciations as a function of property, plant, and equipment (see formula (1) for details). *earnings_bd* is (net income + depreciations) over total assets. *earnings_growth* is the difference between net income and prior year's net income scaled by average total asset. *earnings_bd_growth* is the difference between (net income + depreciations) and prior year's (net income + depreciations) scaled by average total assets. ***/**/* marks significance at the 1/5/10% level based on a one tailed t-test of the difference of the means of public and private firms, respectively the Wilcoxon rank test of the median. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09)*.

Table 4: Summary Statistics of other Firm-Level Characteristics

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
full sample								
total_assets	500	7,829,328	22,338,521	106,659	1,209,399	2,169,357	5,467,627	272,145,589
debt_to_equity	500	0.6005	0.7556	0.0000	0.1860	0.4658	0.7996	8.9670
distance_Berlin	500	291.3900	180.2056	0.0000	149.0000	267.0000	451.0000	708.0000
age	500	16.9000	13.6874	0.0000	7.0000	12.0000	24.0000	73.0000
dividend	500	0.0697	0.0701	0.0000	0.0000	0.0600	0.1003	0.4700
public firms								
total_assets	250	13,767,275	30,266,260	1,261,621	2,564,739	4,882,264	11,749,619	272,145,589
debt_to_equity	250	0.4757	0.3776	0.0022	0.1896	0.4164	0.6436	1.7375
distance_Berlin	250	301.4200	184.6438	0.0000	153.0000	321.0000	452.0000	708.0000
age	250	20.5800	12.4863	3.0000	11.0000	17.0000	31.0000	72.0000
dividend	250	0.1020	0.0718	0.0000	0.0540	0.0925	0.1400	0.4700
private firms								
total_assets	250	1,891,381***	3,629,733	106,659	673,479	1,209,399***	1,983,716	35,700,493
debt_to_equity	250	0.7253***	0.9853	0.0000	0.1564	0.5598***	0.9652	8.9670
distance_Berlin	250	281.3600	175.4514	0.0000	137.0000	249.0000	450.0000	639.0000
age	250	13.2200***	13.8687	0.0000	5.0000	8.0000***	14.0000	73.0000
dividend	250	0.0374***	0.0510	0.0000	0.0000	0.0097***	0.0600	0.2500

This table shows descriptive statistics of firm-level characteristics of 100 German firms for the fiscal years 1903-1907. *total_assets* is total assets. *debt_to_equity* is the debt to equity ratio and defined as (bonds + mortgages + loans + accounts payable)/(capital stock + mandatory reserves according to *Par. 262 HGB* + voluntary reserves). *distance_Berlin* is the linear distance between a firm's headquarter and Berlin in kilometers. *age* is the difference between the fiscal year and the year of a firm's incorporation in years. *dividend* is the announced cash dividend over face value of shares. ***/**/* marks significance at the 1/5/10% level based on a one tailed t-test of the difference of the means of public and private firms, respectively the Wilcoxon rank test of the median. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09)*.

Table 5: Correlation Matrix

N=500	*discret_depr*	| *discret_depr* |	*depr_quota*	*bank_dominance*	*bank_quota*	*earnings_bd*	*ln_total_assets*	*debt_to_equity*	*distance_Berlin*	*age*	*dividend*	*public*
discret_depr	X	**-0.0936**	**0.6537**	**0.1545**	-0.0007	**0.3100**	0.0127	0.0204	-0.0040	**-0.0891**	**0.1263**	0.0557
| *discret_depr* |	**0.5305**	X	**0.1348**	0.0402	**0.0765**	**0.1521**	0.0406	**-0.1207**	**0.0662**	**0.1119**	**0.1301**	0.0404
depr_quota	**0.8428**	**0.6615**	X	**0.1855**	**0.1196**	**0.4738**	**0.2074**	0.0193	**0.1100**	-0.0429	**0.3329**	**0.1852**
bank_dominance	**0.1569**	**0.0982**	**0.1850**	X	**0.6110**	**0.1368**	**0.0936**	**-0.1090**	-0.0329	**-0.1373**	0.0586	**0.1681**
bank_quota	0.0131	0.0623	0.0708	**0.5954**	X	**0.2076**	**0.3004**	**-0.1553**	0.0085	0.0687	**0.1921**	**0.3834**
earnings_bd	**0.3875**	**0.2912**	**0.4625**	**0.1655**	**0.2357**	X	**0.2836**	**-0.3848**	0.0584	**0.2783**	**0.7580**	**0.3020**
ln_total_assets	-0.0086	-0.0140	**0.0801**	0.0643	**0.3069**	**0.2560**	X	0.0704	**0.0776**	**0.3102**	**0.5297**	**0.7050**
debt_to_equity	-0.0176	**-0.0942**	-0.0518	**-0.1216**	**-0.1604**	**-0.2666**	**0.1291**	X	-0.0062	**0.2062**	**-0.2660**	**-0.1420**
distance_Berlin	-0.0176	-0.0129	0.0552	-0.0218	-0.0166	**0.0767**	**0.0816**	**-0.1442**	X	0.0236	**0.0945**	0.0530
age	-0.0612	0.0339	-0.0473	**-0.1369**	0.0077	**0.1939**	**0.2327**	**-0.1661**	**-0.0740**	X	**0.3802**	**0.4057**
dividend	**0.1361**	**0.1076**	**0.2601**	**0.1025**	**0.2724**	**0.7548**	**0.4734**	**-0.1593**	**0.0966**	**0.2755**	X	**0.5157**
public	-0.0061	0.0047	**0.1021**	**0.1681**	**0.3774**	**0.3010**	**0.6370**	**-0.1653**	0.0557	**0.2691**	**0.4612**	X

This table shows correlation coefficients of firm-level variables of 100 German firms for the fiscal years 1903-1907. Pearson correlation coefficients are presented below the diagonal. Spearman correlation coefficients are presented above the diagonal. Bold entries indicate significance at the 10% level or lower. *discret_depr* is the level of discretionary depreciations and defined as the residual of an accrual model describing the level of depreciations as a function of property, plant, and equipment (see formula (1) for details). *depr_quota* is depreciations over property, plant, and equipment. *bank_dominance* is a binary dummy variable that equals 1 if the chairman or the deputy chairman is affiliated with a bank, and 0 otherwise. *bank_quota* is the relative number of board members affiliated with a bank and defined as *bank_member* over *size_board*. *bank_member* is the absolute number of board members affiliated with a bank. *size_board* is the absolute number of board members. *earnings_bd* is (net income + depreciations) over total assets. *ln_total_assets* is the natural logarithm of total assets. *debt_to_equity* is the debt to equity ratio and defined as (bonds + mortgages + loans + accounts payable)/(capital stock + mandatory reserves according to *Par. 262 HGB* + voluntary reserves). *distance_Berlin* is the linear distance between a firm's headquarter and Berlin in kilometers. *age* is the difference between the fiscal year and the year of a firm's incorporation in years. *dividend* is the announced cash dividend over face value of shares. *public* is a binary dummy variable that equals 1 if the firm is listed on the Berlin Stock Exchange, and 0 otherwise. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09).*

Table 6: Bank-Dominated Supervisory Boards and Earnings Kinks

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	*small_profit*	*small_profit*	*small_profit*	*small_growth*	*small_growth*	*small_growth*
constant	13.0666 (7.9994)	14.5562 (9.4631)	**18.9154*** **(11.2854)**	**-4.3381*** **(2.3638)**	**-4.3619*** **(2.3737)**	**-4.2764*** **(2.3722)**
bank_dominance	1.6224 (1.2193)	1.7222 (1.2924)	1.0615 (1.2532)	-0.6055 (0.3784)	-0.6096 (0.3785)	-0.6147 (0.3815)
discret_depr	-	-9.3104 (10.7891)	-	-	0.9439 (5.8750)	-
| *discret_depr* |	-	-	**85.0089**** **(43.133)**	-	-	2.0773 (9.7384)
debt_to_equity	**0.6669**** **(0.2972)**	**0.7458**** **(0.3591)**	**1.0922**** **(0.4492)**	-0.0306 (0.3151)	-0.0354 (0.3173)	-0.0185 (0.4315)
ln_total_assets	**-0.9738*** **(0.5669)**	-1.0849 (0.6737)	**-1.4721*** **(0.8226)**	**0.3592**** **(0.1741)**	**0.3619**** **(0.1757)**	**0.3508**** **(0.1784)**
age	**0.2783**** **(0.1109)**	**0.2749***** **(0.0998)**	**0.2146***** **(0.0651)**	-0.0069 (0.0114)	-0.0072 (0.0116)	-0.0069 (0.0115)
public	**-2.6411*** **(1.5587)**	**-2.5893*** **(1.5194)**	-1.5500 (1.4060)	**-0.7806*** **(0.4729)**	**-0.7879*** **(0.4753)**	-0.7606 (0.4842)
Pseudo R^2	0.2548	0.2624	0.3508	0.0359	0.0360	0.0361
N	53	53	53	158	158	158

This table shows the results of logit regressions analyzing the earnings kinks depicted in figure 1a and 2a. *small_profit* is a binary dummy variable that equals 1 if the firm reports a *roa* within the [0; 0.01] interval. *small_profit* equals 0 if the firm reports a *roa* within the [-0.01; 0[interval. *roa* is net income over total assets. *small_growth* is a binary dummy variable that equals 1 if the firm reports an *earnings_growth* within the [0; 0.01] interval. *small_growth* equals 0 if the firm reports an *earnings_growth* within the [-0.01; 0[interval. *earnings_growth* is the difference between net income and prior year's net income scaled by average total asset. *bank_dominance* is a binary dummy variable that equals 1 if the chairman or the deputy chairman is affiliated with a bank, and 0 otherwise. *debt_to_equity* is the debt to equity ratio and defined as (bonds + mortgages + loans + accounts payable)/(capital stock + mandatory reserves according to *Par. 262 HGB* + voluntary reserves). *ln_total_assets* is the natural logarithm of total assets. *age* is the difference between the fiscal year and the year of a firm's incorporation in years. *public* is a binary dummy variable that equals 1 if the firm is listed on the Berlin Stock Exchange, and 0 otherwise. *discret_depr* is the level of discretionary depreciations and defined as the residual of an accrual model describing the level of depreciations as a function of property, plant, and equipment (see formula (1) for details). Robust standard errors are provided in parentheses. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09)*.

Table 7: Bank-Dominated Supervisory Boards and Discretionary Depreciations

Panel A: First-Stage Logit Regression

Model	(1)	(2)
Sample	Public Firms	Private Firms
Dependent Variable	*bank_dominance*	*bank_dominance*
constant	**6.0909**** **(2.6015)**	**-10.0835***** **(3.1028)**
distance_Berlin	**-0.0023***** **(0.0008)**	**0.0018*** **(0.0009)**
earnings_bd	**14.0794***** **(5.0167)**	0.4648 (2.9465)
debt_to_equity	**-0.8781*** **(0.4672)**	**-0.5012*** **(0.2811)**
ln_total_assets	**-0.3444*** **(0.1783)**	**0.6758***** **(0.2212)**
age	**-0.0628***** **(0.0153)**	**-0.0348**** **(0.0168)**
dividend	-3.9427 (4.5490)	**-11.9819***** **(4.4342)**
Pseudo R^2	0.1947	0.1047
N	250	250

Panel B: Differences in Means before and after Propensity-Score Matching

	Unmatched / Matched	(1) – Public Firms		(2) – Private Firms	
		Treatment	Control	Treatment	Control
distance_Berlin	U	**271.37****	320.80	309.24	272.75
	M	268.58	278.33	309.24	271.61
earnings_bd	U	**0.1332*****	0.0918	0.0556	0.0686
	M	0.1103	0.0999	0.0556	0.0526
debt_to_equity	U	**0.3662*****	0.5462	0.6284	0.7553
	M	0.3984	0.4414	0.6284	0.6419
ln_total_assets	U	**15.357*****	15.776	**14.148****	13.882
	M	**15.383***	15.149	14.148	14.142
age	U	**16.969*****	22.908	**9.424****	14.393
	M	16.659	15.080	9.424	7.695
divdend	U	**0.1148****	0.0938	**0.0231****	0.0418
	M	0.0984	0.0916	0.0231	0.0215

Panel C: Average Treatment Effect of bank_dominance on discret_depr

(1) Public Firms	Treatment Group	Control Group	Difference	Standard Error
Unmatched	0.0104	-0.0071	**0.0175*****	**0.0045**
ATT	0.0018	-0.0060	0.0078	0.0049
(2) Private Firms	Treatment Group	Control Group	Difference	Standard Error
Unmatched	0.0078	-0.0021	0.0099	0.0067
ATT	0.0078	0.0181	-0.0103	0.0171

Panel D: Average Treatment Effect of bank_dominance on | discret_depr |

(1) Public Firms	Treatment Group	Control Group	Difference	Standard Error
Unmatched	0.0294	0.0218	**0.0076****	**0.0034**
ATT	0.0209	0.0203	0.0005	0.0030
(2) Private Firms	Treatment Group	Control Group	Difference	Standard Error
Unmatched	0.0294	0.0229	0.0065	0.0057
ATT	0.0294	0.0327	-0.0031	0.0158

This table presents the results of a propensity score matching on *bank_dominance* employing logit regressions and the nearest neighbor matching method with a caliper of 5%. *bank_dominance* is a binary dummy variable that equals 1 if the chairman or the deputy chairman is affiliated with a bank, and 0 otherwise. *distance_Berlin* is the linear distance between a firm's headquarter and Berlin in kilometers. *earnings_bd* is (net income + depreciations) over total assets. *debt_to_equity* is the debt to equity ratio and defined as (bonds + mortgages + loans + accounts payable)/(capital stock + mandatory reserves according to *Par. 262 HGB* + voluntary reserves). *ln_total_assets* is the natural logarithm of total assets. *age* is the difference between the fiscal year and the year of a firm's incorporation in years. *dividend* is the announced cash dividend over face value of shares. Standard errors are provided in parentheses in panel A. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level in this panel. Panel B shows the results of an evaluation of the matching. ***/**/* indicate significance at the 1%/5%/10% level based on a two-tailed t-test of the differences of the means in this panel. Panel C and D show the differences of the means of *discret_depr* (| *discret_depr* |) for the treatment group and the control group before and after the matching. ***/**/* indicate significance at the 1%/5%/10% level based on a one-tailed t-test of the difference between the mean of *discret_depr* (| *discret_depr* |) of the treatment group and the control group in these panels. *discret_depr* is the level of discretionary depreciations and defined as the residual of an accrual model describing the level of depreciations as a function of property, plant, and equipment (see formula (1) for details). All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09)*.

Table 8: Robustness Checks

Dependent Variable	| ***discret_depr*** |					
Model	OLS		GLS		2SLS	
Firm Type	public	private	public	private	public	private
bank_dominance	-0.0009 (0.0029)	0.0048 (0.0060)	0.0000 (0.0026)	0.0059 (0.0066)	-	-
bank_dominance (=distance_Berlin)	-	-	-	-	-0.0129 (0.0161)	-0.0224 (0.0466)
Constant	yes	yes	yes	yes	yes	yes
Control Variables	yes	yes	yes	yes	yes	yes
Adjusted R^2 / Overall R^2 / R^2	0.3203	0.0368	0.3292	0.0596	0.2980	-0.0210
First Stage R^2	-	-	-	-	0.2255	0.1023
Dependent Variable	***discret_depr***					
Model	OLS		GLS		2SLS	
Firm Type	public	private	public	private	public	private
bank_dominance	0.0046 (0.0035)	0.0073 (0.0073)	0.0046 (0.0039)	0.0111 (0.0113)	-	-
bank_dominance (=distance_Berlin)	-	-	-	-	0.0012 (0.0173)	-0.0176 (0.0554)
Constant	yes	yes	yes	yes	yes	yes
Control Variables	yes	yes	yes	yes	yes	yes
Adjusted R^2 / Overall R^2 / R^2	0.3981	0.1203	0.4047	0.1398	0.4109	0.0926
First Stage R^2	-	-	-	-	0.2255	0.1023

This table shows the results of regression analyses investigating the determinants of firm-level depreciations of 50 private and 50 public German firms for the fiscal years 1903-1907. *discret_depr* is the level of discretionary depreciations and defined as the residual of an accrual model describing the level of depreciations as a function of property, plant, and equipment (see formula (1) for details). *bank_dominance* is a binary dummy variable that equals 1 if the chairman or the deputy chairman is affiliated with a bank, and 0 otherwise. *distance_Berlin* is the linear distance between a firm's headquarter and Berlin in kilometers. All models include a constant and the following control variables: *earnings_bd*, *debt_to_equity*, *ln_total_assets*, *age*, and *dividend. earnings_bd* is (net income + depreciations) over total assets. *debt_to_equity* is the debt to equity ratio and defined as (bonds + mortgages + loans + accounts payable)/(capital stock + mandatory reserves according to *Par. 262 HGB* + voluntary reserves). *ln_total_assets* is the natural logarithm of total assets. *age* is the difference between the fiscal year and the year of a firm's incorporation in years. *dividend* is the announced cash dividend over face value of shares. Robust standard errors are provided in parentheses. Bold entries and ***/**/* indicate two-sided significance at the 1%/5%/10% level. All values are as reported by *'Handbuch der deutschen Aktien-Gesellschaften' Vol. 9 (1904/05) - Vol. 13 (1908/09).*